VOLUME 12 #1 SEPTEMBER 1996 PRICE $6

EXPERIMENTAL MUSICAL INSTRUMENTS

For the Design, Construction, and Enjoyment of Unusual Sound Sources

DOG BARKS AND LION ROARS

The gentlemen pictured on this page are Spike Jones and his City Slickers, seen performing on *flit guns* — actually bug sprayers equipped with accordion reeds. They're here as part of Ray Brunelle's celebration of sound effects in radio, film and theater, the first half of which you'll find in this issue of *Experimental Musical Instruments*. Ray's article is a treasure chest of sound-making ingenuity, from the sandboxes full of starch used to imitate the sound footsteps in snow, to the hand-held gadgets designed to recreate dog barks and lion roars, all laid out before you in colorful historical narrative.

Also in this issue of *Experimental Musical Instruments* you'll meet Ta Tam of the Hanoi Conservatory of Music, maker of musical instruments that are innovative, and at the same time rooted in the traditional Vietnamese instrumentarium. You will find instructions on making a conch shell trumpet, complete with discography and additional background information. You'll also find plastic ukulele patents, innovative keyboard designs, a selection of home-buildable children's instruments, and an integrated assemblage of inexpensive electronic sound gadgetry known as "The Terrence Dougherty." ... And much more. So open now, and read.

Spike Jones and his City Slickers with flit guns. See the article starting on page 8.

I WOULD LIKE TO KNOW if any of *EMI*'s readers know of any musical instrument(s) that have some kind, any kind, of a connection with wolves. This probably sounds strange when you first hear it but actually I have found many such connections [between musical instruments and animals] in my own look into the subject. Some examples of this are, for instance, the reed instrument used for snake charming, or the many horns connected with hunting, some of which even have special uses like the "fox horn" used in fox hunts or the "beagle horn" used in hunting with beagles. So far the only connection with wolves and a particular musical instrument has been Prokofiev's choosing the French horn to represent the wolf in "Peter and the Wolf," (a hunting instrument), and also an ancient Celtic battle horn called the carnyx. Only two examples of the carnyx have ever been found, but one of them had a wolf-head shaped bell that actually had movable jaws. Later on in musical history many animal-headed horns were created which were inspired by the Roman/Celtic era. I hope I have given you somewhat of a good idea of what I am looking for and I hope that I hear from you sometime with an answer to this question that I have. Again any connection between wolves and a particular musical instrument would be of great interest to me. Thank you.

Robert Hutton
7 Pheasant Brook Ct., Bedminster, NJ 07921

[The following paragraph refers to a review of two cassette releases from letter-writer tENTATIVELY, a cONVENIENCE and others, by Warren Burt, in the March 1996 issue of *EMI*. As the signature on this letter indicates, tENTATIVELEY, A cONVENIENCE now goes by the name anonymous.]

WARREN'S REVIEW is certainly encouraging, but I should note that "Vermin Supreme" isn't one of my "sound sculptures"! He's

a friend of mine who travels around the U.S. pretending to run for mayor of various cities. He's sort of a political stand-up comedian but he's at his best when he "camPAINs" on the streets — he gets into hilarious interactions — in BalTimOre people even remember him from previous camPAINs, responding with great enthusiasm — and I'm not just talking about the "art" crowd. I'm talking about the wo/man on the street!

Seeing the foto of the string instruments with the "Stroh-like horns" [also in *EMI*'s March 1996 issue] reminds me of my friend and collaborator John Sheehan. He made an instrument called the "Horn Guitar" which he probably played as part of the Denver based group "Big If" and which he definitely played as part of "the booed usicians" and probably as part of "Something that Dissolved the Shadow of Something that was next to Something that Burned Twice Once" — two BalTimOre based groups that included myself as well as instrument builders Neil Feather and John Berndt.

I've enclosed what is, alas, the best foto of it that I have [reproduced below].

I think John S made one or more horn guitars in Denver which probably got dismantled, left behind, lost, given away, or destroyed. The one in the picture is the BalTimOre version — made around '87. It had one or two strings, some horns and a small hinged box (at the top of the neck). The horns (and maybe the box) had microphones inside them which were intended for making feedback. This latter seems to 've been its main distinctive sound-making feature but there may've been some subtleties I don't recall.

anonymous

Above: Graphic from a political flyer promoting Vermin Supreme.

Right: John Sheehan's Horn Guitar.

I HAVE AN UNUSUAL REQUEST (and quit laughing) to ask you and to your readers of *EMI* as this does involve a musical instrument but not of this world:

The Bible speaks of Gabriel's trumpet. In that the Archangel Gabriel, someday in time, will blow on his trumpet certain blasts that will cause our planet earth to break apart in an apocalyptic cataclysmic catastrophic gigantic quake never witnessed before by us humans nor by the angelic host.

Now I would like to know if you or anyone else could figure out (possibly by the aid of a computer) what will be the range of notes that the Archangel intends to blow on his trumpet to bring upon the end of earth.

Why not turn this into a contest for readers to send in their answers and the best one should win a surprise gift? (However, and quit laughing, we must warn participants of this contest not to get too carried away in this endeavor lest someone prematurely brings upon the end of our planet...)

Don Dreis
405 E. 7th St. #4, Bloomington IN 47408

ONE OF THE RESIDENTS of our little island is a well-known TV Chef named Grahm Kerr. As my wife is a professional chef, they got to know one another fairly well. One day she said to me, "Chris, you're a composer; why don't you do a piece for Grahm." My idea was to use kitchen utensils and appliances to make up a sort of ballade cuisine. After trying a number of things, I came up with the method of recording everything at half-speed on my 4-track. That is, recording sounds at seven-and-a-half ips, and transferring the recordings to cassette using three-and-three-quarters ips on the reel-to-reel. Mixing bowls became deep Oriental gongs, mixmasters sounded like motorboats. But the best and most usable effects I got from using two or more tea kettles at full boil (whistling) and using the gas knobs to produce different pitches and effects. By mixing regular speeds on the tape recorder with the slowed-down versions (and sometimes slowing the tape down twice), I was able to produce some very mellow string-like harmonies. I was also able to simulate vibrato effects by picking the kettles up slightly and shaking them as they whistled.

Christopher Horne

NOTES FROM HERE AND THERE

EMI's VOLUME 11 CASSETTE AVAILABLE NEXT MONTH!

Not too long after this issue reaches you, the latest in *EMI*'s annual cassette compilation series will become available. *From the Pages of Experimental Musical Instruments, Volume 11* presents the sounds of instruments that have appeared in articles in the magazine over the past year, covering the four issues of *EMI* Volume 11, dated September 1995 through June 1996. A panoply of instruments are to appear, including: Trimpin's Liquid Percussion, John Herron's homemade signal processing devices, Ken Turkington's aeolian harp, Wayland Harman's mouthbow, Eric Leonardson's coil spring instrument, Reed Ghazala's dying radios, Susan Rawcliffe's exotic ceramic wind instruments, Fred "Spaceman" Long's Jokers, Bart Hopkin's rotary rasp, and possibly a couple more not yet confirmed at the time of this writing.

IN THIS ISSUE

EXPERIMENTAL MUSICAL INSTRUMENTS
For the Design, Construction and Enjoyment of Unusual Musical Sound Makers

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SUBMISSIONS: Experimental Musical Instruments welcomes submissions of articles relating to new or unusual musical instruments. A query letter or phone call is suggested before sending articles.

The Volume 11 cassette is available from Experimental Musical Instruments for $8. See this issue's notices column for details. Order now; we'll send the tape around the start of September.

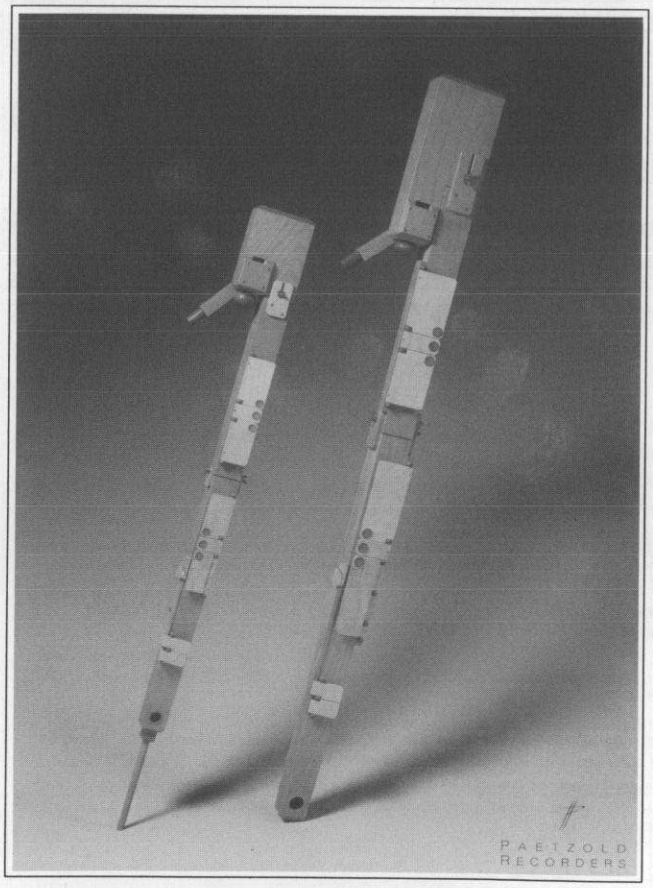
REED GHAZALA, whose literary excursions into circuit-bending and other far-reaching topics have appeared in almost every issue of *Experimental Musical Instruments* for the last several years, has had to cut back his writing commitment due to an increasing work load. Rather than appearing in every issue, his articles will now be included in alternate issues. Yes, he will be missed, but take heart: while you won't see *EMI*'s resident sound explorer, philosopher and dreamer in this issue, he will be back in the next.

AT A MUSIC FESTIVAL here in the Bay Area recently, *EMI*'s longtime reader and friend Barbara Robben came across a display of instruments from Paetzold Recorders in Germany. In addition to making conventional instruments for the upper members of the recorder family, the people at Paetzold have developed an unusual design for their bass and contrabass recorders, using high-grade plywood in pipes of square cross section, with innovative key designs. The rectilinear design allows for more affordable construction, with a tone quality that the Paetzold literature claims to be comparable or superior to traditionally made recorders in the lower ranges. Barbara sent along their brochure, and we've taken the liberty of reproducing a couple of pictures below. The Paetzold company is at Gartenstrasse 6, 8939 Markt Wald, Germany. The instruments are available in the U.S. from Bill Lazar, 1377 Bluebird Ct., Sunnyvale, CA 94807, phone/fax (408) 737-8228; e-mail jblazar@aol.com.

GINGER SUMMIT AND JIM WIDESS have just this last spring published *The Complete Book of Gourd Craft*. Because they had a surfeit of material for that book, they decided to hold back most of the information on musical instruments in order to expand it into a separate book. *Gourd Musical Instruments* will focus on how-to techniques with examples of historical and contemporary gourd instruments that utilize the particular instrument family's form.

Jim and Ginger are soliciting photographs of instruments to consider for inclusion in the book now. Makers of gourd instruments are invited to send snapshots of their work, with an eye to making professional slides later. If you have any questions, you can call Jim Widess at (800) 544 3373, or write to The Caning Shop, 926 Gilman Street at 8th, Berkeley, CA 94710.

EQUINOX PRODUCTIONS in Thousand Oaks, California, led by Dawn Kunzkowski, recently sent us one of their beautiful Earth Tone Drums. The drums are made from cans or similarly shaped food containers (e.g., oatmeal or salt containers), with the drumhead, as well as a covering over the body, made from specially treated brown paper bags. There is an attractive textured leathery quality to the head and covering on the finished drum, decoratively enhanced with twine, feathers and colorful cloth (see the photo, next page). The drum uses only common materials, most of them free, and can be made quickly and easily, making it a good project for children. The tone, in the drum that I received,



Paetzold recorders, including the unusual square bass and contrabass instruments.

was not so impressive — rather flat and dry. (The same drum head type might work more effectively on a drum with better-defined air resonances, such as a long, narrow tube drum.) Yet as a finishing technique for drum bodies with other sorts of heads, the treated paper technique has great promise. (Aside from tin cans, I bet this stuff would hold on PVC, notoriously unattractive and unamenable to other finishing methods.)

Rather than selling the finished drums — the pleasure, after all, is in the making — Equinox Productions makes an instruction booklet available. The cost is $9.95 from Equinox at PO Box 1442, Thousand Oaks, CA 91358-0442.

FILMMAKER MARIANNE POTJE has recently completed a film entitled *Inspiration & Invention: The Musical Instruments of Hal Rammel*. The film traces the path of inspiration, creation and fruition of Hal Rammel's unique instruments, including the bibliolin (pictured below), the one-string snath, and the sound palette (featured in *EMI* Vol. 8 #4, June 1993). Viewers are taken to Hal's stone farmhouse studio, and then to one of his instrument invention workshops.

Eleven of Hal's instruments will be on display at the Harold Washington Library Center at 400 South State Street in Chicago (8th floor, South Exhibit Case) until September 30, 1996. There will be a showing of the film on Saturday, September 14 at 1 PM in the video theater, lower level of the same building.

The photo below shows one of the display instruments, the bibliolin. Hal writes, "In a dream, it was handed to me by a bookseller who called it 'a very rare bibliolin.' In the dream the book had no title, but using a battered copy of *How Music Grew* captures the dream's feeling quite closely. The book is hollowed out. The neck and endpin are fixed to a wooden box inside the book, so it sounds much like a cigarbox fiddle."

LONGWAVE INSTRUMENTS in Britain makes theremins and components for MIDIfying them. Barry Wooding at Longwave recently sent along the photograph below of their affordably priced pocket-sized model. They also have full-sized models, and their MIDI interface works with theremins from other manufacturers as well as their own. Contact Longwave at 23 Ashley Lane, Hordle, Lymington, Hampshire, SO41 0GB, England. See the notice in this issue's Notices column for more information.

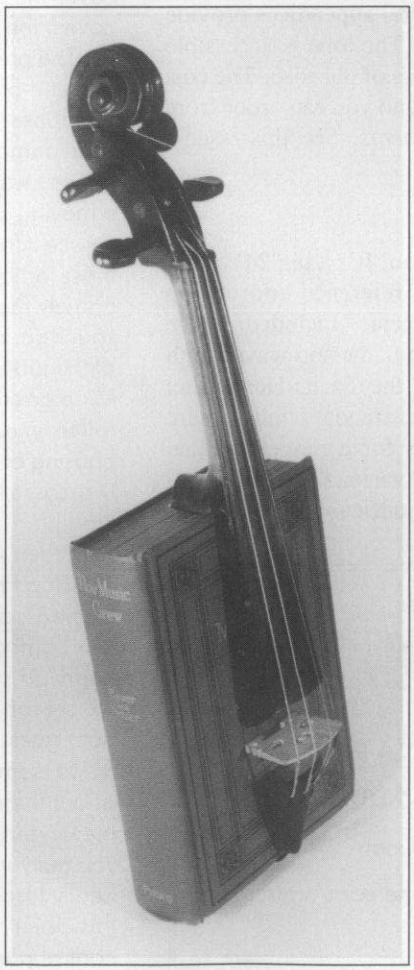
OH, MAN, there are just too many web sites popping up to keep up with them. We aren't able to present anything like an exhaustive listing, but here are a few more web sites and Internet discussion groups relating to musical instruments that people have recently mentioned to us.

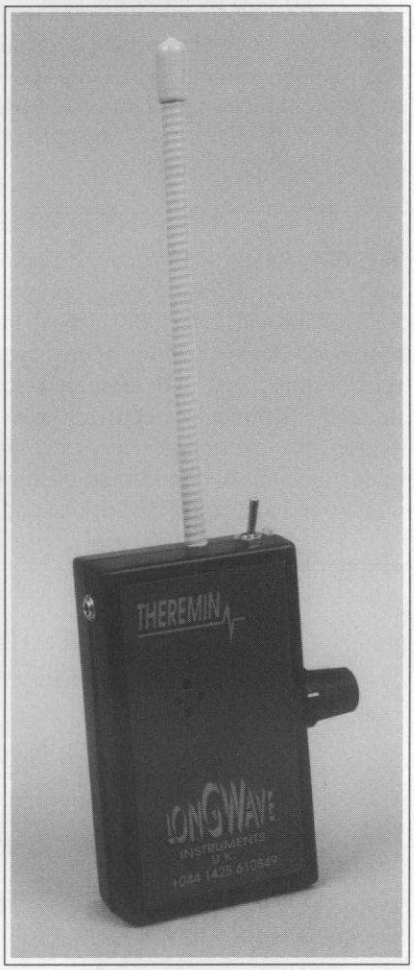
Musicworks (Canadian new music magazine):
http://www.musicwoks.web.net/~sound/

Tony the guitarmaker: http://www.cybozone.com/fg

Tommy Dog: http://www.panix.com/~jjprinz/bbl.htm

Tai Hei Shakuhachi: http://www.mind.net/music/monty.html





Above: The Equinox drum, made with specially treated paper. The colors, missing from our black & white reproduction of the photo, are beautiful.

Center right: "A very rare bibliolin," made by Hal Rammel.

Far right: The Longwave Pocket Theremin

Southeast Just Intonation Center: http://www.afn.org/~sejic

Lovely Music (new music recording company): http://www.lovely.com

Gravikord Home Page (Robert Grawi's gravikord, unique string instrument): http://members.aol.com/gravikord

Reed Ghazala: http://www.iac.net:80/~cage/reed.html

The Galpin Society (British scholarly society for organology): http://www.music.ed.ac.uk/euchmi/galpin

Woodwind Quarterly and many woodwind makers: http://www.windworld.com

The Improvisor (journal of improvisation): http://www.mashell.com/~zzajdr/improv.htm

The Tactus Press (resources on historic percussion and theremin): http://www.ccsi.com/~bobs

The Glass Orchestra (Canadian performance group working entirely with instruments of glass): http://www.io.org/~rixax/Glass.html

Experimental Musical Instruments: http://www.thecombine.com/emi/

NOW AVAILABLE! *Musical Instrument Design: Principles for Instrument Making*, by *EMI*'s editor, Bart Hopkin, published by See Sharp Press. It's a large-format book of just under 200 very full, generously illustrated pages. This new book is more technically oriented than Bart's earlier book, *Making Simple Musical Instruments* (which is also available through *EMI*). It provides an overview of design principles for acoustic instruments, covering familiar sound-making systems as well as unusual and exotic ones. It takes a practical, hands-on approach, so that readers can apply the information in constructing instruments of their own design. Along the way, there are instructions for making many particularly interesting sample instruments. Several appendices provide easy reference for important information. The tone is accessible and friendly, without sacrificing seriousness of purpose. The cost for *Musical Instrument Design* is $18.95, and you can order from us here at *Experimental Musical Instruments*. See this issue's Notices column for details.

THE EMI WALL CHART is now available too! It's a big 24" x 36" wall poster, full from top to bottom with reference information for makers and lovers of musical instruments. Included on the poster are charts showing frequency, pitch name and wavelength relationships, just and tempered scales, the Sachs-Hornbostel musical instrument categorization system, standard music wire gauges, the overtone series, scale factors for a range of equal temperaments, overtone relationships for various vibrating systems (free bars, rods fixed at one end, cylindrical and conical air columns, etc.), an array of useful formulas and values, and so forth, and so on. All this has been rendered in a manner both readable and beguilingly attractive by graphic artist Gwendolyn Jones. In fact, even if you don't foresee having use for all that information, you'll still want the EMI Wall Chart, because it's a beautiful thing to see, and it's completely unique. The price is $12 (that includes shipping), available only through *Experimental Musical Instruments*. See the Notices column for details.

AUSTRALIAN SOUND SCULPTOR Ernie Althoff (whose series of postcards featuring possible sound machines have been appearing in recent issues of *EMI*) recently wrote to *EMI* about, among other things, a set of bamboo sound machines he has been working on. This gave rise to the trans-Oceanic exchange that follows, starting with his original letter:

These funny coincidences keep on coming up: at the end of last year I took out a bamboo machine I'd built in 1993 that had never worked properly, set it up to find out why, made what I saw were the necessary design modifications, and was very pleased when it then played the random music I'd originally intended for it. This success started me off on assembling another Bamboo Orchestra. This grouped ensemble is better planned than the 1988 bunch [featured in *EMI* Vol. V #1, June 1989]. In that lot I just *built*, thrilled to have discovered that electric power could give me such a variety of timbral finesse. With this batch I've been planning more the 'orchestral' side of things — which instruments cover the highs, which deal with mid-range melody lines, who covers the bass ends.

The photos with this letter illustrate the two bass machines — cassette-player-powered rollers in node-point-suspended bamboo tubes. The coincidence mentioned earlier in this letter is this. You demonstrate a beater scraping a notched and ridged moving wheel as sound source (*EMI*, Vol. # 11, #1, p. 33), then a moving beater scraping on a notched and ridged tube as sound source (*EMI*, Vol. 11, #3, p. 36) and, independently of both these articles, I work on another permutation of this concept, namely the moving notched (knurled) beater scraping a tube as sound source. The rolling beaters sit very comfortably in the ends of the tubes and the sound is gorgeous! [see photos, next page.] Mine are fairly rhythmic due to the irregularity of the (bamboo) rollers in each, but this could be fixed if desired. I kind of like the phasing of the two differently timbred and pitched rhythms as the two cassette player motors run at different speeds (one is fairly tired!).

I then extended the ideas behind this construction to the "Electric Friction Tube Set" illustrated on the 'postcard' [shown on next page]. I've also thought of recording the longer of my two bamboo tube machines and getting a computer/sampling buddy to sort of mock-up a multi-pitched 'fake' tape version of the set for me. I must admit I like my little master control panel, but I guess there are those that'd like to see the motors hitched up to something more resembling a keyboard. The business about the rich overtones — my bamboo machines (particularly the longer split tube) come into a whole new world of sound when you put your ear up very close to the centre of the sounding tube. Really luscious! I'm sure a microphone positioned very close to this point would bring it out. This means another row on the control panel — acoustic (or mikes further away) plus mixing in

COMMUNICATING WITH
EXPERIMENTAL MUSICAL INSTRUMENTS

POST: PO Box 784, Nicasio, CA 94946

PHONE/FAX: (415) 662-2182

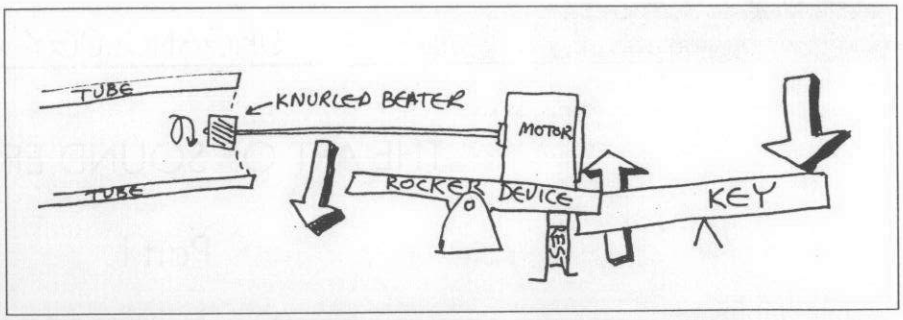
E-MAIL: ExpMusInst@aol.com

WEB SITE: http://www.thecombine.com/emi/

the close-miked overtones, etc. I hope this would work with metal tubes as well as my bamboo one.

Ernie Althoff

P.S. The 'handles' on the rolling beaters are joined to the capstan drives on the cassette players with clear plastic tubing. This also allows gravity to flex the beaters downward.



From the editor: When the above letter first came, I sent back a note saying "You speak of electronically sampling the sounds because 'there are those who'd like to see the motors hitched up to something more resembling a keyboard.' My suggestion: for a more keyboard-like control system, keep all the motors running all the time, but have the knurled nuts normally positioned so that they don't contact the tube — they just spin silently inside the tube, or just above it, or whatever. Then have some simple mechanism, analogous to a keyboard, which allows the player to press them selectively, causing whichever one is pressed to dip and come into contact with its tube. It would have more keyboard-like control, but retain some of the tactility of the version you actually built (as opposed to sampling)."

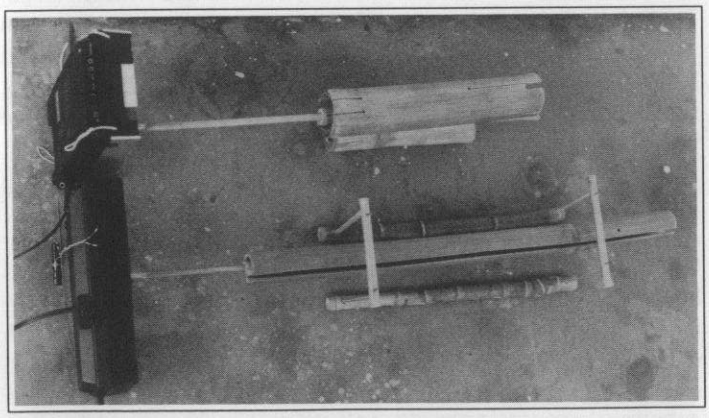
Continuing the dialog, Ernie sent the following:

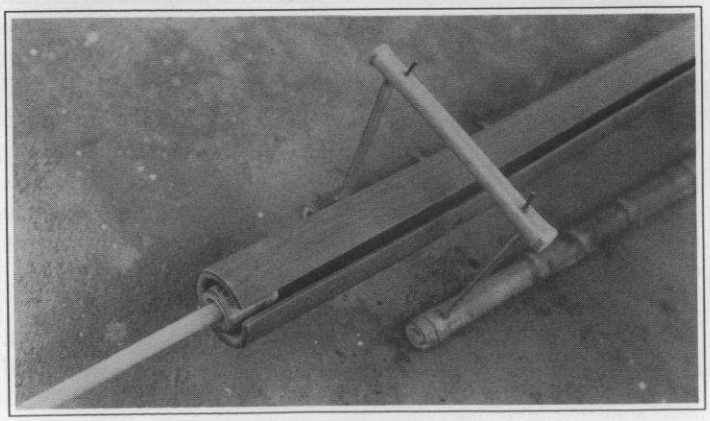
Thanks for your note concerning your keyboard thoughts for the "Electric Friction Tube Set." Yes, it would certainly work, and quite easily too. It would, however, eliminate that nice little 'attack' and 'decay' (can we call 'em that?) as the motors are switched on and off and the knurled wheels spring into (and out of) motion. And there is still the question of motor speed control. This certainly gives volume contrasts for certain pitches.

Here's a quickie system using the motor weight to rock the beater up again when the key is let go [drawing above].

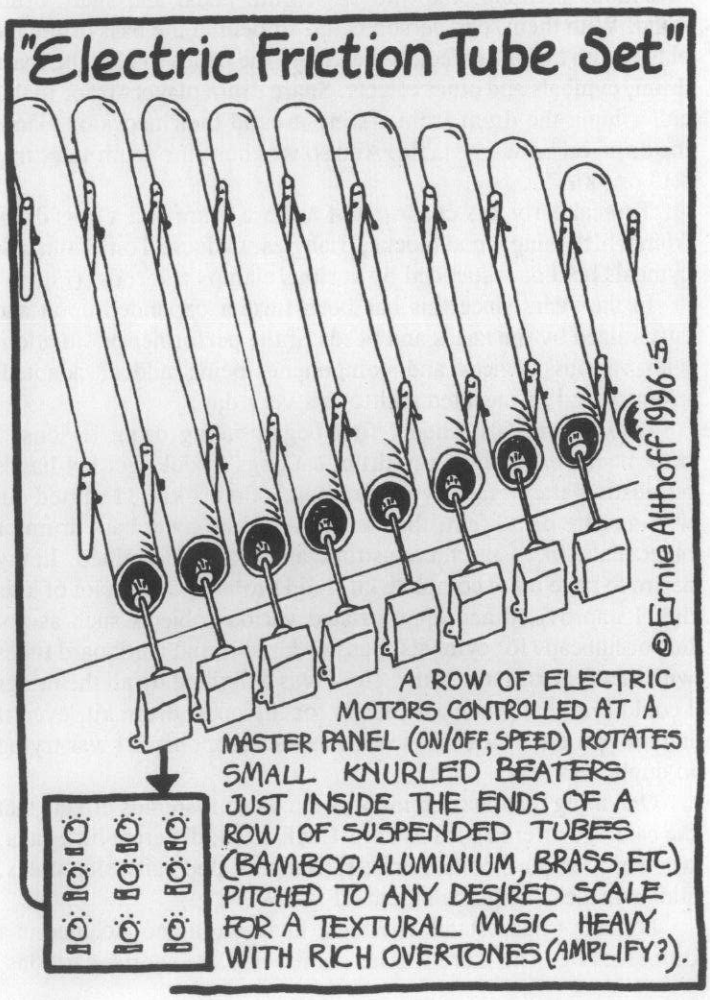
What's important for me here is that this is a great example of "Trans-Pacific Idea Ping-pong." I lob one across to you, you embellish it and lob it back. Great! I love it! Makes me feel that my pursuits down here in Australia are not so isolated after all. All power to *EMI*.

Ernie Althoff





Photos above and below: Ernie Althoff's knurled beaters in bamboo tubes, driven by cassette machine motors.



THE ART OF SOUND EFFECTS

Part I

By Ray Brunelle

Dedicated to my Father and the memory of my Mother and my Brother, who got me started in all this.

This is Part 1 of a two-part article on the history of sound effects in theater, film and music. Part 2 will follow in *EMI*'s next issue.

Drum sets are peculiar things. The more I've thought about it the more I've realized that they might be the only traditional (indigenous?) musical instrument that is actually made up of other instruments. This evolved out of myriad of things — part circumstance, part chance and part necessity.

In the early 1900s, bands and orchestras had two or three drummers each. One played the bass drum, one played the snare drum, and a third (the "utility man") played cymbals, wood blocks and sound effects (or "traps" and "trappings", as they were commonly known — a term which was taken from the word "contraption"). The need for all those people changed with the inventions of things like the bass drum pedal and snare drum stand. With them, one person could sit behind the bass drum and play it with his or her feet, which freed the hands to play the snare drum, cymbals and other effects. Snare drum players prior to this either hung the drum from a sling around their necks or placed the drum on a chair or table. And so was born the drum set, "trap set" or "kit."

Typical early kits consisted of a snare drum and a bass drum from which hung wood blocks, triangles, Chinese Tom Toms and cymbals held or suspended by various clamps and rods. (Fig. 1)

In the years since this has been further expanded upon and customized by the tastes and needs of the performer or situation, with various devices and components being added, adapted, invented and re-invented still to this very day.

Back in the 60s when I first began taking drum lessons, I remember poring over any drum catalogs I could get my hands on, lusting after a factory-made kit. Like most kids, I started out with a snare drum first, then added a second-hand bass drum or other pieces here and there as time and money permitted. In my desire to have more complete kit, I did probably what a lot of kids did: I improvised and appropriated various objects such as pot lids or hubcaps for cymbals, pans or large round cardboard tubes with lids for extra tom toms, etc. I was delighted by all the things I could find that produced sounds for my quasi drum kit, even if it didn't produce the same sounds as the components I was trying to duplicate.

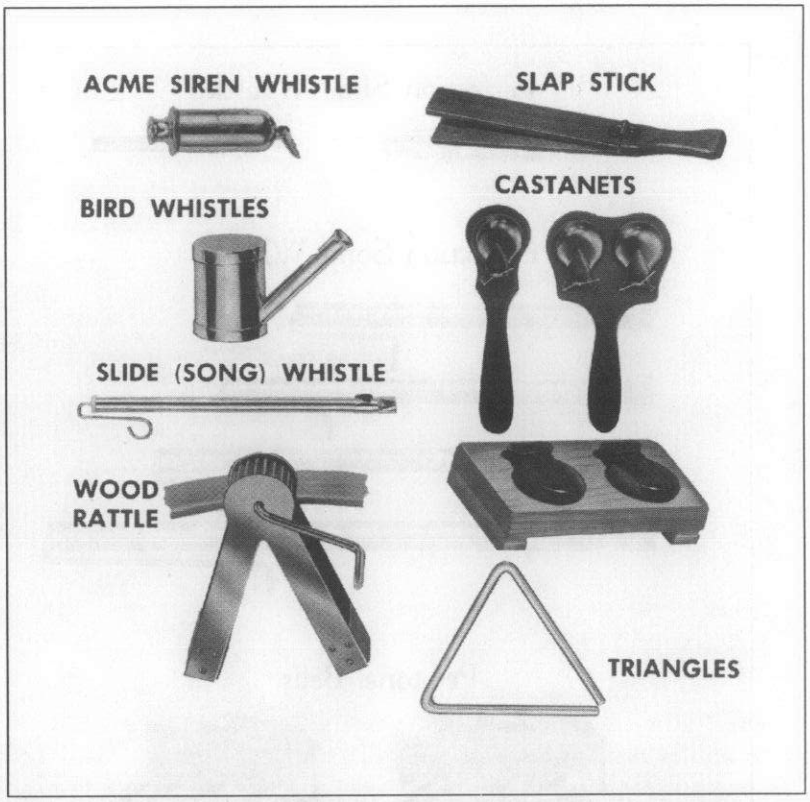
One thing that puzzled me was the various sounds effects that the catalogs offered such as the ACME siren, different bird calls, wood and temple blocks, ratchets, triangles, pop guns, slap sticks, slide whistles, sleigh bells, etc. (Fig. 2)

I couldn't understand why these items would be included in a drum catalog. The more music, old movies and shorts, cartoons, catalogs and articles I was eventually exposed to, the more I realized how important these effects were to those early drummers. I became impressed with how effective, expressive and how much fun sound effects could be — not just in music, but in everything ranging from early dramatic theatrical productions, to Burlesque and Vaudeville, Radio & TV, cartoons, film and so on. I found that the older a catalog was, the more sound effects it seemed to offer. Indeed, there were companies that *specialized* in sound effects. (Fig. 3)

In the 1900s, sound effects were just as important and vital an item as any instrument. The Walberg & Auge *Perfection* catalog of 1915 lists about 40 different types of bird calls and whistles alone. These included song or slide whistles, ocean liner whistles, train whistles, ferry boat and fog horns, etc., not to mention various wood blocks, castanets, rattles, slap or shot pads (for making gun shot sounds), fourteen different types of bells, railroad & locomotive imitations, pop guns, dog barks and more. (Fig. 4)

Sound Effects (aka Sound FX & SFX) have been providing illusory sounds for audiences as far back as the theater of Aeschylus, Euripedes and Sophocles. For audiences in ancient Greece, the rumble of thunder was provided by "leaden balls bounced on stretched leather." In Shakespearean times the popular method was "rolling a cannon ball down a wooden trough which then fell onto a huge drumhead." Large single-headed frame drums, often used in pairs, were also used to produce thunder sounds. In his book *Magic, Stage Illusions,* Albert A. Hopkins describes how in large opera houses a more complicated system was used. A cabinet with five or six slanting shelves in it was placed up high against a wall backstage. Each shelf held about six cannon balls that were held in place by a hinged door. When the signal was given, a stage hand would open one or more of the compartments and the balls would drop down into a wooden trough about 20 feet long which had irregular surfaces in it lined with zinc plates, adding to the rumbling effect. At the end of the trough the balls would drop through the floor to the gallery by means of special slants, and provisions were made so that the balls could be stopped anywhere along their path. By regulating the number of balls dropped, almost any type and length of thunder effect could be produced.

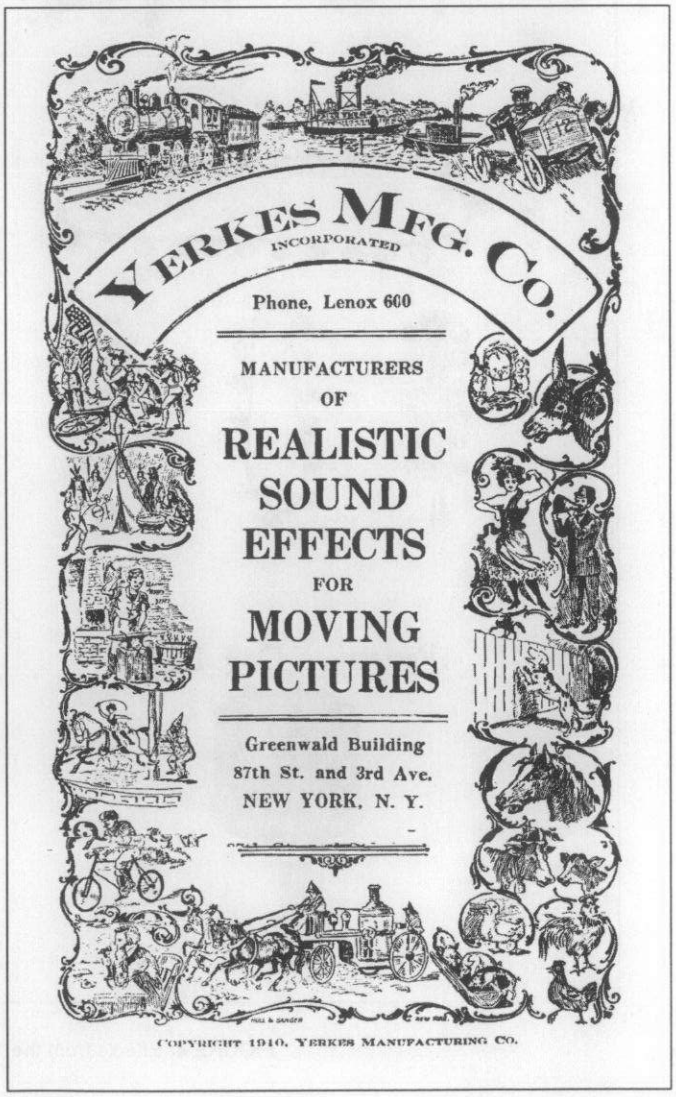
Another device Hopkins mentions was called the "Rumble Cart." This was a large box filled with heavy objects or material and mounted upon irregularly shaped wheels. When pulled or pushed along the floor backstage it produced a thundering effect. (Fig. 5)



Left: FIGURE 1. Old trap kits.

Above: FIGURE 2. Sound effects from a 1960s catalog.

FIGURE 3: Yerkes catalog cover, 1910.



In 1708 John Dennis invented a new method for providing thunder for one of his plays by vertically suspending a large copper sheet by wires with a handle on one end and giving it a shake whenever the effect was needed. His play wasn't a success, but his thunder effect was, and other producers started borrowing this idea. Every time he would encounter someone using his effect he would accuse them of "stealing his thunder," and that's how that expression came into the English language.

Another method for use in Radio, invented by NBC sound FX artist Stuart McQuade, was called the "Thunder Screen." This was a copper screen stretched onto a frame onto which a contact microphone was attached. Striking the screen with a small mallet produced the thunder as well as other explosive sounds. (Fig. 6)

This was probably similar to (though more primitive than) the sounds that a spring reverb tank in an electric guitar amp makes when bumped against or shaken.

I have a particular penchant for comedic sound effects.

Slapstick comedy actually takes it's name from a device called a "Slapstick" (aka "whip crack"). (Fig. 7)

My parents loved to watch old comedies and variety shows. Whenever Laurel & Hardy, Chaplin, Keaton, the Marx Brothers, the Little Rascals, Keystone comedy shorts, Red Skelton, or Jackie Gleason came on, I came running — not to mention any Fleischer Brothers cartoons, Walter Lantz's Woody Woodpecker, Jay Ward's Rocky & Bullwinkle, and any Warner Brothers cartoons featuring Mel Blanc, who did most of the voice characterizations and vocal imitations, and Treg Brown who did all the wonderful SFX. (Incidentally, it

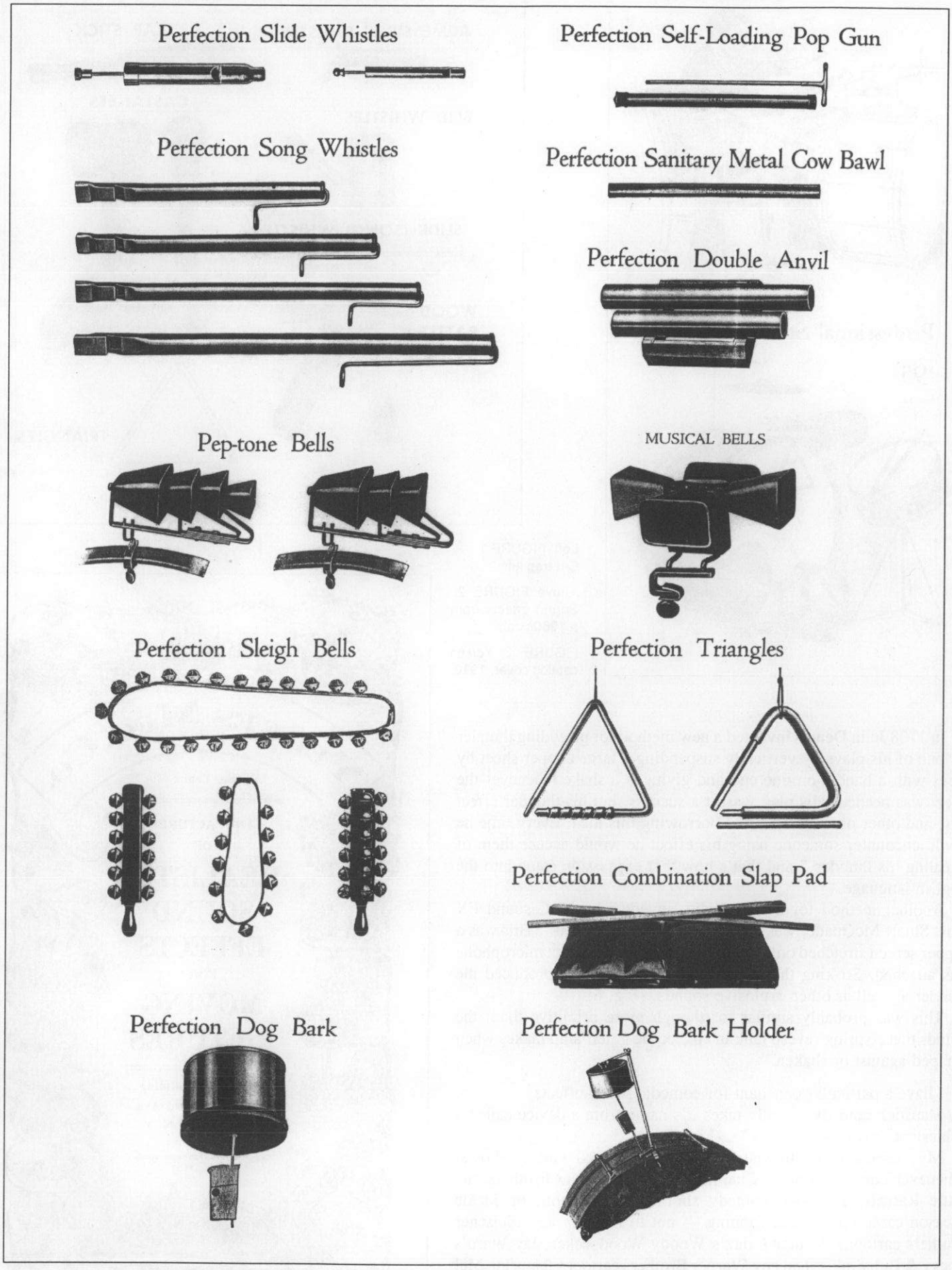
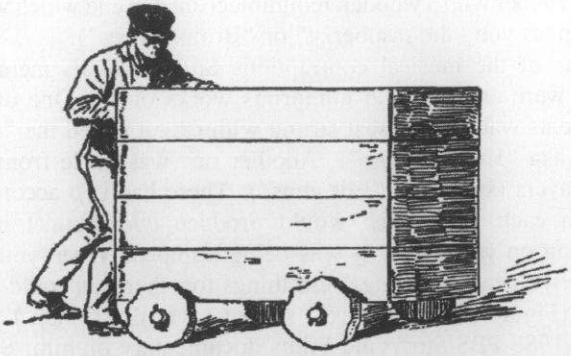
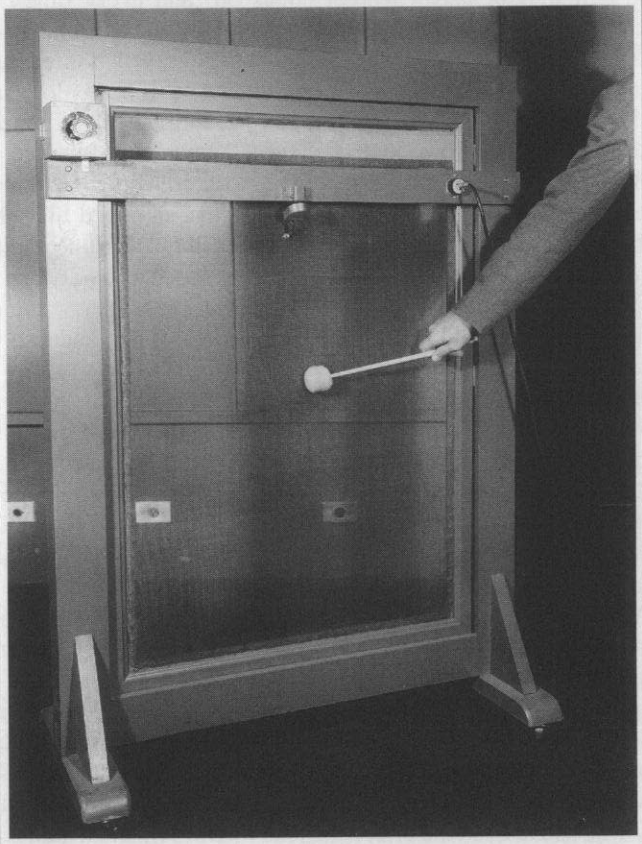
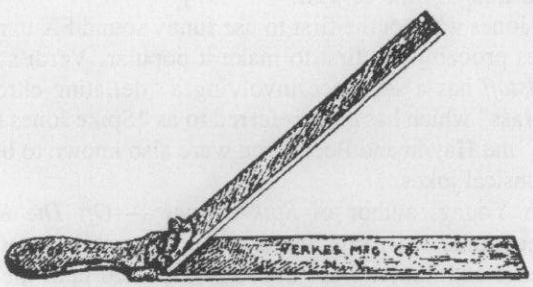


FIGURE 4: Effects from the 1915 Walberg & Auge *Perfection* Catalog.



RUMBLE CART





WHIP CRACK
(Spring-hinge) can be operated with one hand. **$1.20**

was radio actor Arthur Q. Brian that provided the voice of Elmer Fudd.)

For me the Three Stooges seemed to have more sound effects per square inch of film than anything except for cartoons. Joe Henrie (and later, Morrie Opper) were responsible for dubbing the sound effects for the Stooge shorts. As far as I was concerned, they were the Fourth Stooge (and half of the fun). Next time you see a Three Stooges short, check out how prominent and up-front the FX are mixed into the sound track. Not only are they funny FX, but they are larger than life.

Some of the techniques and methods used for the Stooges' antics were: cracking walnuts for knuckle crunches, ukulele or violin plinks for eye pokes, a muffled kettle or bass drum hit for a bump in the stomach, hitting a rolled up carpet with a fist for body blows, various ratchets or twisting stalks of celery for when ears or limbs were twisted. The glugging/drinking effect was done by pouring water out of a one gallon glass bottle into cotton batting (which would muffle the splashing).

Many of the sound FX used in the Stooges shorts were first recorded for use in a Walter Catlett short called "Get Along Little Hubby" in 1934. On the re-recording stage, the studio's production chief was infuriated when he saw producer Jules White mixing these outrageous Sound FX in a reel, and stopped the session. Jules White insisted that the comedies needed the "cartoon quality" of sound effects in order to accent the visual gags. The two men argued, and Jules said he would abide by whatever audience reaction the film short got at the preview. The audience response proved Jules was right, and from then on sound FX were a key ingredient in the Stooge shorts.

Cartoon sounds not only emphasize the action in an absurd and amusing way, but can also convey emotions. In early cartoons (such as the Fleischer Betty Boop cartoons), drummers' traps were used extensively for sound FX. Not only did they furnish funny sounds for the action, but they were often used to compensate for lack of dialog, where an irate character was often accompanied by angrily played duck call.

Naturally, a brick on the head would hurt, but when it's coupled with the hollow sound of a temple block, it suggests that the person's head is empty. This magically transforms a violent act into a humorous one and makes it less painful. I can only imagine how this may have been expanded upon each time by the sound effects artists, editors, producers and directors who might have given it their own signature, extending the idea for the gag as it evolved into a hysterical (historical?!) sequence of events — adding a slide whistle as a character slid down the wall, then dropping a sack of potatoes or foot locker on the floor as he hit the ground, then adding canaries singing to suggest being unconscious. (Incidentally, it was producer Jules White's whistling talents that provided a lot of the bird chirping FX in the Stooge shorts.)

Ed Bernds, who directed some of the Stooge shorts, thought that Joe Henrie "was damn close to being a genius as a sound FX editor," and said "he was never satisfied with a sound effect until he had gotten it as startling and as funny as he could make it." It was in the early 40s that Joe Henrie was replaced by Morrie Opper (Henrie left to join the Armed Services in W.W.II). I credit Morrie for adding the violin plinks whenever someone got poked in the eye. Stooge shorts prior to this did not have any sound effect associated with this gag. (I *did* hear a ratchet or crunching effect during this interim period, but haven't pinpointed the short where the "plink" was first used.)

Ed (who was also a former sound mixer himself) recalls having to

FIGURES THIS PAGE

Top: FIGURE 5. Rumble cart

Center: FIGURE 6. Thunder screen

Bottom: FIGURE 7. Slapstick from Yerkes Catalog

add sound to a previously released silent picture called "Submarine" when he first came to Columbia back in 1929. The picture was being remade as a "sound effects picture" and he remembers a "dreary all night session on the sound dubbing stage trying to sync noises *live* while watching the screen.

One interesting note is the use of sound FX in the currently popular Simpsons cartoons. Most of the FX used in the show are not of the cartoon variety. They consciously use real sounds for most of the action on the screen to make it more believable, and the only time you hear cartoon-type sounds used are in the "Itchy & Scratchy" segments.

I had no idea, as I watched these cartoons and short films, that I would become so infatuated with sound effects, or that I would become a sound effects designer myself, or that I would even be writing this article years later. But they really opened my ears to the world of sound around me, and I began my own odyssey and research into this realm. I am by no means an expert or historian (or even a writer, for that matter), and I borrow much from sound effects artist and author Robert Mott, through direct conversations and his books.

The music of people like Spike Jones, Frank Zappa, Harry Partch, Carl Stalling, Raymond Scott, Leroy Shield (Little Rascals, Laurel & Hardy), Edgard Varèse and others really spurred me on and I began acquiring my own little collection of effects to use when I played (much to the dismay of some of the singers and bands I've worked for).

I don't think Hoagy Carmichael had a $25 Canadian Goose call in mind when he wrote "Skylark"... I let it rip one night behind a female vocalist at a carefully chosen point in the song where the lyrics go "...crazy as a loon...", and brought the house down, band and all. I now thoroughly enjoy the dubious reputation of having been "kicked out of more bands than I've played in" as my reputation for the unexpected precedes me, but it was worth it!!

That's when I "came out of the closet" so to speak — *Fibber McGee's closet,* that is... It was the genius of SFX artist Monty Fraser, working in the popular Fibber McGee & Molly shows on live radio, who created the sound of a tremendous pile of junk falling out of an overstuffed closet every time Fibber opened the door. This became one of the most listened-for sounds in Radio and was a highlight of every show.

Incidentally, Spike Jones was the drummer in the band for some of the Fibber McGee & Molly radio broadcasts, and he was also the drummer on the record session for Bing Crosby's "White Christmas" song hit.

(A fact maybe better suited for *Ripley's Believe It Or Not...*)

Obviously the music of Spike Jones had a *slightly devious* effect on me. Before the inception of the City Slickers, a fellow musician recalls that "Spike approached comedy through the back door. He had some funny contraptions on his drums that didn't come out of a drum accessory catalog. Things that he put together himself." Spike Jr. says, "It was often that little extra something that got Spike the gig for whatever he was auditioning for. His trap set was very embellished and he was sought after because of this. Most drummers just had a xylophone and a basic set of drums." Among Spike's other credits were the Al Jolson Show, The Burns & Allen Show, and The Eddie Cantor Show as well as becoming the staff drummer for CBS and performing on many other record dates.

With the City Slickers, Spike used tuned cowbells, bulb and klaxon ("ah-oo-gah") horns, blank pistols, small cannons, bird calls, washboards, wheel rims, temple blocks, jaw harps, sirens, vocal imitations & FX, razzer whistles (a short flat thin tube of flexible rubber with a wooden mouthpiece on one end which when blown gives you "the raspberry" or "Bronx Cheer").

Some of the musical contraptions Spike and his members created were amazing and humorous works of art. One of the instruments was a toilet seat strung with catgut called the "Guitarlet" (aka "Latrinophone"). Another one was made from old bug sprayers (known as "Flit guns"). These had two accordion reeds in each gun which would produce two distinct notes depending on which way it was being pumped. When you got four or five people playing these things together you could play a song. (Figure 8: See this issue's front cover illustration.)

In a 1988 PBS/Storyville Films documentary on him, Spike is seen explaining how he got the idea of combining funny sound FX with music while attending a concert once by Igor Stravinsky conducting *The Firebird Suite*. Apparently Stravinsky had on a brand new pair of patent leather shoes on, and every time he would rise to give a downbeat his shoes would squeak. Spike had a lot of trouble suppressing his laughter at this (as well as infecting others around him) and went home thinking that if he could plan "musical mistakes" or substitute sound FX in the place of notes in the score he might be able to get some laughs out of people.

By the mid 30s he acquired a penchant for collecting any kind of junk that made a funny sound or noise and indulged himself whenever possible. His collection began to fill his apartment and take over his car as well. In 1934 he finally formed a novelty band (originally called "Spike Jones and his Five Tacks"), got some of his friends over and made some home recordings, and that's how he got started.

But that's one story. (*There are many...*) Another story goes that he got the idea from when he missed hitting the opening chime on the Bing Crosby show and out came a loud thud, causing the band and audience to go into gales of laughter. And yet another story he told was that he was simply inspired by other comedy bands of the 30s such as The Korn Kobblers, Hoosier Hotshots, and the Schnicklefritzers, and decided to form his own comedy band.

As if Spike's zaniness wasn't enough, when he got his own TV show he even had a sound effects person *from the studio*, named Parker Cornel, working behind the scenes.

Joe Siracusa (Spike's drummer from 1946-52) also went on to become a very successful Sound FX man whose credits included the sounds for Alvin and the Chipmunks, Rocky & Bullwinkle, Mr.Magoo, Gerald McBoing Boing, (a cartoon about a boy who spoke in sound effects instead of words), and a number of Warner Brothers cartoons.

Mel Blanc was also known to grace the ranks of Spike and his crew from time to time as well.

Spike Jones was not the first to use funny sound FX in music, but he was probably the first to make it popular. Verdi's comic opera *Falstaff* has a sequence involving a "deflating chromatic scale of brass" which has been referred to as "Spike Jones before his time," and Haydn and Beethoven were also known to be very fond of musical jokes.

Jordan Young, author of *Spike Jones — Off The Record* (highly recommended!) says the explosive possibilities of combining music and humor were not fully explored until the dawn of the record business. French musical comedy star Maurice Farkoa recorded his famous "Laughing Song" back in 1896, and Ed Meeker made his Edison cylinder recording of "I'm a Yiddish Cowboy" back in 1909. Jordan credits him as "perhaps the first to use sound effects to accompany each line of a song, instead of

throwing them in haphazardly."

The Six Jumping Jacks were distinct predecessors to Spike Jones and the City Slickers. They were among the earliest bands to play novelty songs and include sound effects in a precise manner in the tunes in appropriate places. Irving Aaronson and his Commanders made several humorous recordings in the late 20s with sounds such as barking dogs, birds chirping and cute childlike vocals (all of which Spike Jones would later claim as his trademark), and The Kidoodlers were a male vocal quartet which toured Vaudeville in the 30s and augmented their voices with over 100 toy instruments and props.

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Jordan Young — Spike Jones information
Ted Herring — Spike Jones anecdotes and pictures
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Chris Clay / Clay Designs — consultation & support materials
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Peter Moutis — support materials
Bart Hopkin & EMI — advice, support materials, and providing a forum for this sort of thing.

*NOTE: Mr. Ludwig does a lecture/presentation clinic called "A History of Percussion" which covers the drum from Colonial times, through three wars and into the silent movie era, and ends with a demonstration of sound effects for a Radio play. For more information contact: Wm. F. Ludwig II — Consultant, 1080 Nerge Rd. #106 Elk Grove, IL 60007.

Ray Brunelle is a drummer, composer, inventor and Sound FX designer whose credits include sounds for Arboretum Systems, NED/Synclavier, Intelligent Music Software, Amiga World Magazine, The Other Guys Software, Dr. T's Music Software, iMedia Communications, OSC's "A Poke in the Ear with a Sharp Stick — Vol. III" (AIFF CD ROM for Mac), and a contract with Kurzweil Systems to produce sounds and CD projects for their K2500 series workstations. He's composed music for the University of Lowell on Computer Robotics which won an award from NASA, and music for other projects which were funded by the New Hampshire State Council on the Arts and the National Endowment for the Arts, and received credit as a SFX consultant for a "live" radio show produced in Worcester, MA which was picked up by NPR. He's been the subject of three NHPR interviews, and helps produce personalized children's tapes for Disney/Cake & Candle Productions. One of his cymbal designs was also manufactured by the Zildjian Cymbal Co.

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Stay tuned for "The Art of Sound Effects, Part 2," including bibliography, coming next issue!

A MUSICAL INSTRUMENT WORKSHOP IN HANOI

by Jason Gibbs

Tucked into a corner of the Hanoi Music Conservatory campus is a spare building that doubles as the workshop and living space for Tạ Thâm and his crew of musical instrument artisans. The front room is both a living room and an instrument showroom; the back room is where the work is done, evidenced by the wood trimmings, an assortment of bamboo tubes, and the various manual and power tools found throughout the room (see Example 1). Upon entering the building, one cannot help but notice the variety of unusual instruments hanging from the walls. These are both traditional instruments of Vietnam and instruments of Tạ Thâm's invention.

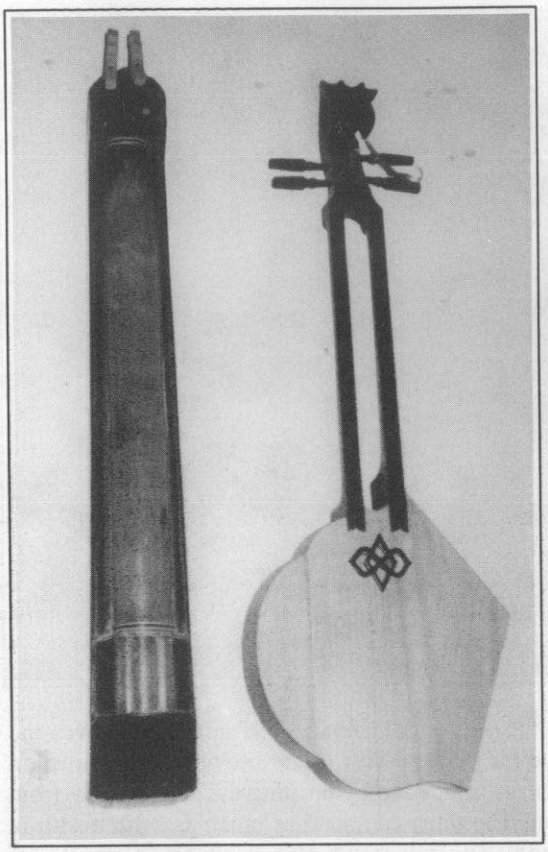
Tạ Thâm was born in 1929. He came of age during the time Vietnam was fighting for its freedom from France and took part in the historic battle of Điện Biên Phủ in 1954. Soon after North Vietnam achieved its independence he enrolled in the first class at the Hanoi Conservatory in 1956 where he studied both classical Western and traditional Vietnamese instruments. While studying the violin and the piano, he came to realize that these instruments were the result of continuous improvement and development over time and asked himself why Vietnamese instruments should not also benefit from such improvement. Many traditional Vietnamese string instruments are soft in volume, better suited to playing in intimate chamber settings or personal contemplation than for the concert stage. He felt that instruments needed to be built with fuller resonance and louder volume. Another dream behind his work and research has been to create a Vietnamese orchestra made up of instruments with a degree of expression and precision and in a variety of tessitura like the Western orchestra.

In 1957 he set out to research Vietnamese traditional instruments in order to understand their history and construction with a view towards improving them. From that time he also began to design his own instruments. In a traditional society like that of Vietnam, going against the grain and venturing into new areas is often not encouraged and Tạ Thâm's visions were often neglected and at times even obstructed by the musical authorities. For this reason he often had to work independently. This independence, however, made it difficult to earn a living. Periods of poverty slowed the realization of his dreams. At times, he had to work in rice fields, as a laborer and even as a fisherman in order to support his research. Despite many years when he hid his work for fear of derision, he was rewarded in 1987 when he won several national prizes for his inventions. For the past several years he has been building traditional instruments at the National Conservatory of Music. During their American tour in October 1995, I met several Vietnamese musicians touring with the Thăng Long Water Puppet group from Hanoi, some of whom used traditional instruments constructed in Tạ Thâm's workshop.

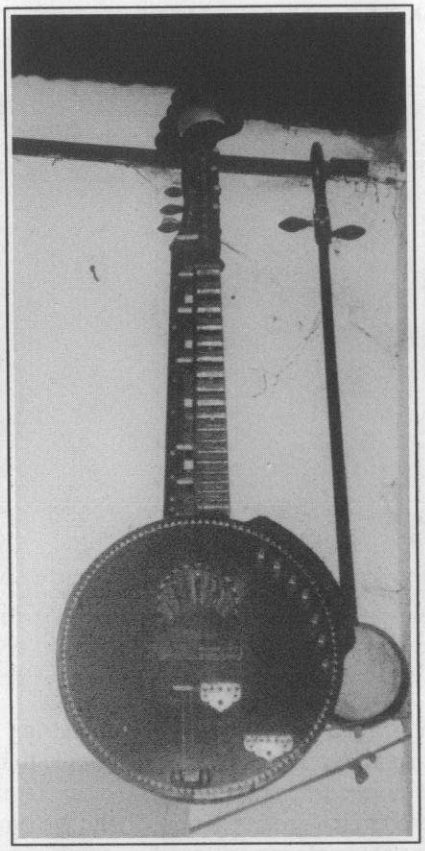
Tạ Thâm's invented instruments use the raw materials common to traditional instruments, such as hard and soft woods, various sizes of bamboo, gourds, etc... He bases his inventions not only on the instruments of the ethnic Vietnamese, but also upon those of Vietnam's many ethnic minorities. To further his research, he has traveled extensively in northern Vietnam's mountainous regions, searching out the instruments of the country's minority peoples. During my stay in Hanoi in 1995 he took several trips to Hòa Bình, a city on the edge of the mountainous home of the Mường people.

EXAMPLE 1: Putting the finishing touches on a *đàn bầu* in Tạ Thâm's workshop

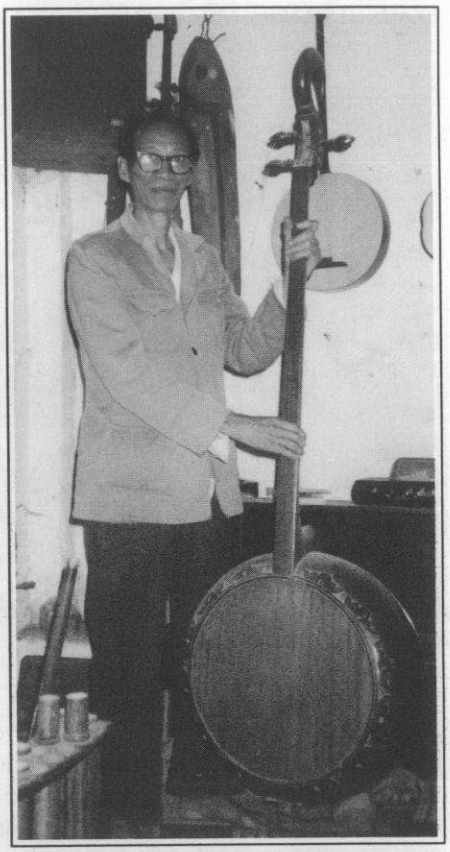
Vietnam is best known for its string instruments, like the 16 string zither *đàn tranh* — a cousin of the Chinese *zheng*, the Japanese *koto* and the Korean *kayagum*; the 4 string lute *đàn tỳ bà* — a cousin of the Chinese *p'i p'a* and the Japanese *biwa*; the *đàn nguyệt*, the 2-stringed moon-shaped lute; and the *đàn nhị*, the two stringed bowed lute (similar to the *tro duong* from Cambodia). There are also a wide range of percussion instruments like drums (*trống*), woodblocks (*mõ* and *phách*), bells (*chuông* and *quả nhạc*) and gongs (*cồng* and *thanh la*), and castanets (*sênh*). Two string instruments unique to Vietnam are the *đàn*



EXAMPLE 2: Left — Tạ Thâm's two-string variation on the *Đan Bầu*. Right — *Nam Tranh Kép*.



EXAMPLE 3: *Trăng Thau*, a variation on the traditional, *đàn nguyệt*.



EXAMPLE 4: Tạ Thâm's *contrabasse vietnamienne*.

bầu, or monochord, and the *đàn dáy*, a 3 string lute used primarily in *hát ả đào* music, a highly literary entertainment song form performed by professional singers. Vietnam's many minority peoples have also created a wide range of distinctive musical instruments.

Many of Tạ Thâm's instruments are hybrids of existing Vietnamese instruments. In Example 2 on the left is a đàn bầu made of a mixture of wood and bamboo with two strings and necks allowing for two fundamentals and two harmonic series. On the right is his *Nam Tranh Kép*, using design characteristics of two traditional instruments, the angular-shaped *đàn đáy* and the flower-shaped *đàn sến*. It has two necks, each with a string — one made of silk, one made of metal. The *Trăng Thau* (Example 3) is based on the moon-shaped *đàn nguyệt*, that uses the heightened frets common to Vietnamese lutes allowing for liberal pitch bending. An innovation of the *Trăng Thau* is the adoption of two different fret systems side by side. In Example 4, Tạ Thâm is pictured with what he called, in French, a *contrabasse vietnamienne*, in fact modeled on the much smaller *tính tẩu* lute used by shamans of the minority Thái people of northwestern Vietnam. Many of Tạ Thâm's creations are percussion instruments. The *nhạc tiền* (Example 5) is a variation on the traditional *song loan* and *sênh tiền*. It has a clapper connected to a woodblock like the former and a number of rattling coins, augmented by bells like the latter. The *dàn mõ trâu* (Example 6) uses a series of tuned water buffalo-shaped cowbells that are rattled side to side.

In a traditional country like Vietnam, there is no concept of experimental music like we have in the West — there is no avant-garde to speak of. Vietnam's cultural policy encourages the unity of the nation's peoples and the development of culture that serves them. An inventor of musical instruments like Tạ Thâm is less interested discovering new sounds or performance techniques than in working with the raw materials and musical system at hand. He is curious about activities outside Vietnam and is interested in meeting his colleagues in the world of musical instrument invention. You can probably find him in his workshop at the Hanoi Conservatory.

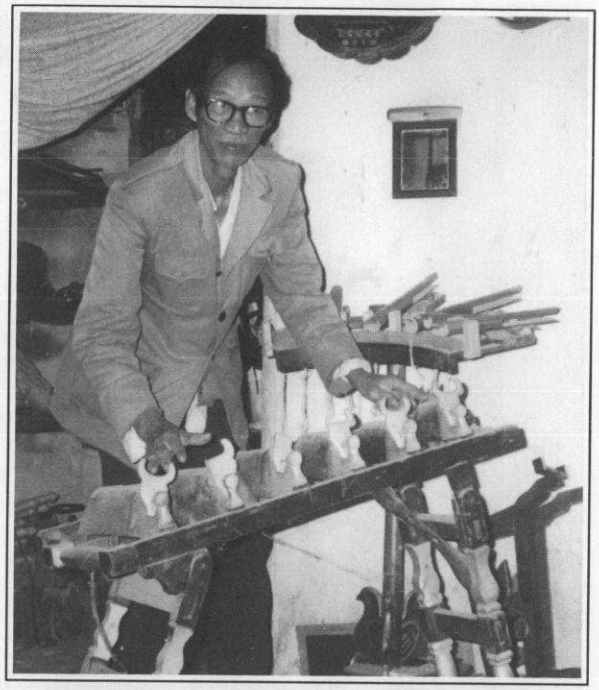
DAN BAU

If one sound had to be chosen to evoke Vietnam, for many it would be the sound of the *đàn bầu*, also known as the *đàn độc huyền* (single-string instrument). The word *bầu* means gourd and refers to the dried gourd fastened to the handle, surrounding the string at the point where it connects to the handle. In the past this gourd may have served as a resonator, but today it survives as a decorative feature. Nowadays the *đàn bầu* is constructed using hardwood for a frame and softwood for the surface. The handle is made of flexible carved bamboo or water buffalo horn, and the string is made of metal. At the present time it is almost always amplified (Example 7, a *đàn bầu* side by side with gourd). Historically the *đàn bầu* was played by blind street musicians or *xẩm*. The earlier *đàn bầu xẩm* (Example 8) is constructed from a split bamboo tube. It used a silk string and occasionally substituted a half coconut shell for the dried gourd. In the days before amplification a trunk could be placed under the instrument as a resonator.

Historical records trace the invention of the *đàn bầu* to 1770.

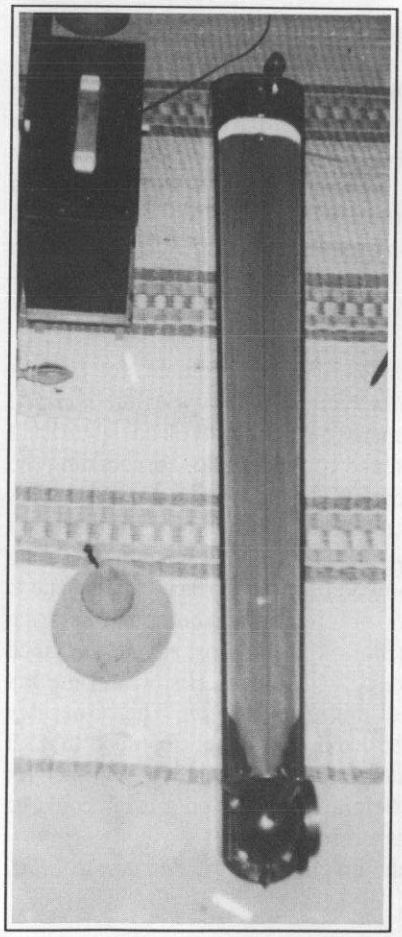
EXAMPLE 5 (below): *Nhạc tiền.*

EXAMPLE 6 (right): *Dàn mõ trâu.*



but some scholars have claimed earlier origins and antecedents for the instrument. Some speculate that it originates from a string stretched from the teeth, others believe its antecedent is the *trống quân* — a "drum" consisting of a rope fastened to the ground at both ends stretched over pole that serves a bridge. This pole is positioned over a trunk, or empty pit that serves as a resonator. Ta Tham believes it originates from the *tàn máng*, an instrument of the Mường minority constructed from a bamboo tube with a bamboo thread carved from out of it that is plucked like a string. None of these instruments, however, employ harmonics, the performance technique that makes the *đàn bầu* unique. It uses these harmonics exclusively, produced at nodes at 1/2, 1/3, 1/4, 1/5 and 1/6 the length of the string. A small bamboo plectrum held in the right hand plucks the string while the lower side of the hand stops the string at the appropriate node. The left hand moves the handle to bend the pitch downward by moving in the direction of the instrument, or upward by pushing the handle away from the instrument. The pitch can bend as much as a 4th or 5th in either direction. The left hand also produces a variety of vibratos, glissandos and grace notes. The instrument's virtuosity and expressiveness are to found in its left hand technique, which should have a subtlety that mimics the sound of the Vietnamese singing voice or declaimed poetry.

Traditionally the *đan bầu* has been played by groups of blind musicians, and in Vietnamese chamber music (*nhạc tài tử*). More recently it has also been used in the ensembles of *chèo* and *cải lương* theatrical music. In Vietnam today there is a growing virtuosic literature with solo works and concertos written for the *đàn bầu*.



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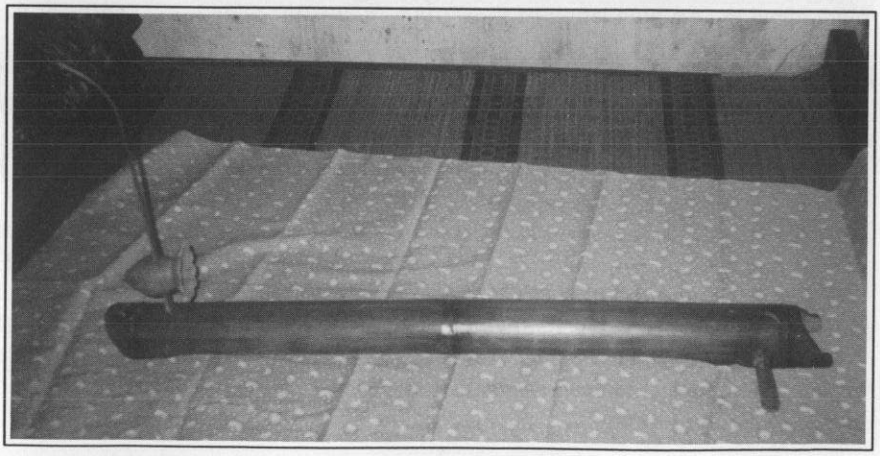
EXAMPLE 7 (left): *Đàn bầu*

EXAMPLE 8 (right): *Đàn bầu xẩm*



SOME BASICS ON SHELL TRUMPETS AND SOME VERY BASICS ON HOW TO MAKE THEM

By Mitchell Clark

At the request of the editor, to whom I once casually mentioned that I had made a few shell trumpets, I will write something about the process of making such an instrument. But, to the probable disappointment of the editor, there's not an awful lot for me to say about their construction, as the simple forms of shell trumpets are quite easy to make. So, in the style of an entry in a cookbook where the author gives lots of history, lore, and anecdotes, and then finally gets down to the recipe, somewhere in what follows are some basic instructions for making shell trumpets. Endnotes — often referring to illustrations which may be consulted in other sources — are included, and contribute additional texture.

I'll start by saying that when I was young, I knew about shell trumpets but obviously did not quite understand the principle of how they worked. I thought that no alteration was made to a conch's shell, which I thought was very beautiful and that it would be a shame to deface it. Rather, it seemed that getting the shell to sound was a matter simply of blowing *very, very, very* hard. Fortunately I did not rupture any blood vessels trying out this theory.[1]

But the shell trumpet (an instrument in the domain of study of the *organologist*) has indeed been altered from the animal's natural shell (a natural object in the domain of study of the *conchologist)* in such a way that would make life uncomfortable for the actual mollusk itself (an animal in the domain of study of the *malacologist*) — that is, a hole's been poked in the shell. A shell trumpet will obviously have to made after the mollusk has (willingly or unwillingly) vacated.

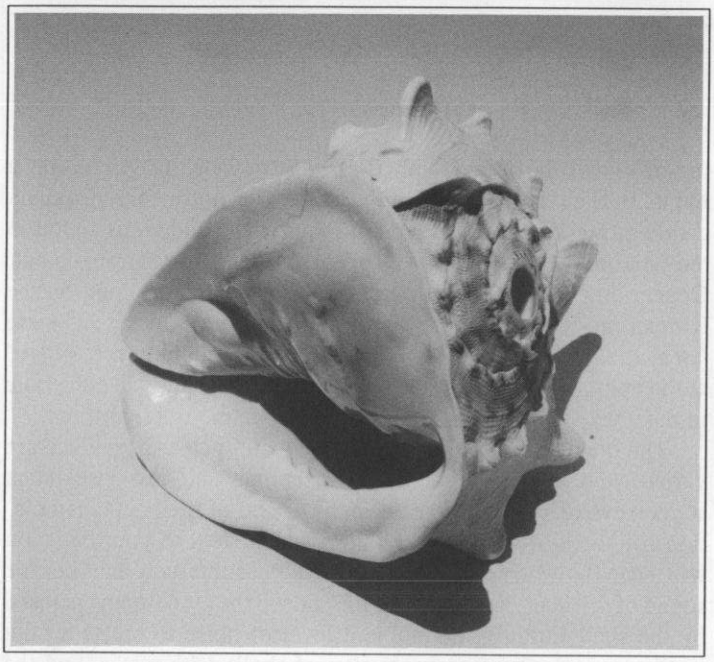
There are two basic places this hole may be placed, and so there are two basic approaches that can be taken for making a conch shell into a shell trumpet. A hole is made either at the apex (the tip of the spire) of the shell, or, alternatively, in one of the whorls to the side of the spire. The mouth hole may be at the apex if the spire is shallow, as on a *Strombus gigas* ("queen conch" or "pink conch," common in the Caribbean),[2] *Cassis cornuta* ("horned helmet," found in the Indo-Pacific region), or *Cassis tuberosa* ("king helmet," found in the Caribbean). The mouth hole may be on the side of the spire if the spire is more steep, as on a *Charonia tritonis* ("Triton's trumpet," distributed throughout most of the tropical Pacific and Indian Oceans). In some cases the hole itself forms the mouth hole; in others, a mouthpiece is added. Mouthpieces seem to be a matter of what tradition has evolved, as sometimes the same species of shell may be found with or without a mouthpiece. For instance, a variety of approaches will be found with *Charonia tritonis*. In Polynesia, a mouth hole cut into the side of the spire is the norm.[3] Occasionally a side-blown *tritonis* will have a mouthpiece added, as found in the Marquesas Islands;[4] this appears to be a rare arrangement. Concerning end-blown *tritonis,* on the Hawaiian *pu*[5] and on the Korean *na*,[6] a mouth hole is cut into the apex. On the Japanese *hora*, the *tritonis* (called *horagai*) is given a mouthpiece, placed at the apex.[7] Other shells used for trumpets usually have the hole in the apex, with a mouthpiece or, more commonly, without.

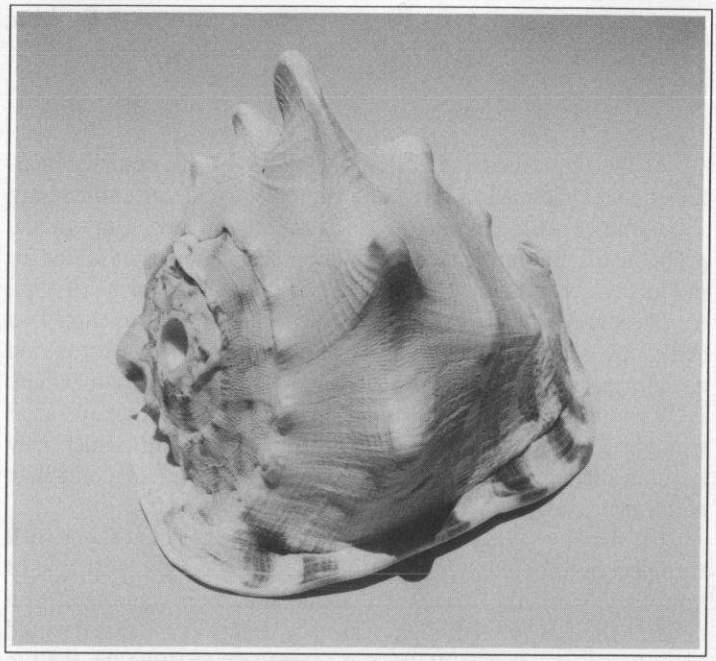
The qualities of sounds which shell trumpets can produce are varied, and also layered in the meanings and responses such sounds evoke. As children we learn of one of the poetic associations of shells — that if you hold a conch shell to your ear, you will hear (however far away from the coastline you may be) the sound of the sea.[8] Yes, perhaps it is indeed the air column enclosed by the shell filtering the ambient level of noise to create a faint roaring sound. But the association of shells with water, and the sea especially, is also at the basis of the many of the ceremonial uses of shell trumpets around the world. Shell trumpets have often been used at great distances from the sea, and this has contributed to the sacredness of their sounds. Thus the hearing the of sea in a shell may be a vestige of these older, profound associations. Shell trumpets produce a profound sound in every sense of the word — there is a sense of the sound coming from the deep past. This is both true as regards the actual antiquity of the use of shell trumpets, which dates to the Neolithic era,[9] and in the very shell itself. The apex of a univalve gastropod such as a conch or a snail is the oldest part of the shell (the place where the young animal started growing): in blowing a shell trumpet the sound is passing from the oldest place to the youngest—from the past towards the present.

Concerning this antiquity of the use of shell trumpets, the etymologist Eric Partridge puts forth the idea that the word "conch" may be of echoic — that is, onomatopoeic — origin.[10] Echoic, I suppose, of the sound of the blast of a shell trumpet, and thus — given the early Greek roots of the word "conch" — indicating in the very word itself the great antiquity of their use. A common term applied in a number of parts of Polynesia to the shell trumpet — *pu* — would certainly also seem, in its own way, to be echoic.

The most common use of shell trumpets in many parts of the world — and they have a remarkably wide distribution — is as a signaling device. A shell trumpet may announce curfew in Samoa, or announce that fresh fish is for sale in Fiji, or may serve as a

foghorn on the Mediterranean. The shell trumpet often has a magical role in relation to weather. It may on the one hand be used to calm rough seas, or on the other to summon wind when seas are becalmed.[11] Shell trumpets are also used in musical contexts, most often in conjunction with ritual. The Indian *shanka* has held a place in the Hindu religion for millennia. There it may be used as a ritual vessel as well as a trumpet.[12] The *shanka* is also of significance in Buddhism, where, besides its musical uses, it figures importantly into Buddhist iconography. Befitting their role in Tibetan ritual music, where they are called *dung-dkar*, shell trumpets made from *shanka* receive detailed decoration, with carving on the surface of the shell itself and with added ornamentation in metal and semi-precious stone.[13] Shell trumpets were also important ritual instruments in Pre-Columbian South and Central America and in Minoan Crete. In these latter areas, skeuomorphic reproductions ("the substitution of products of craftsmanship for components or objects of natural origin") of shell trumpets, in ceramic and stone, are found archaeologically.





Figures 1 & 2: Two views of an end-blown shell trumpet made by the author from a *Cassis cornuta* ("horned helmet"); length 8¼", pitch B_3 (open) or A_3 (hand-stopped).

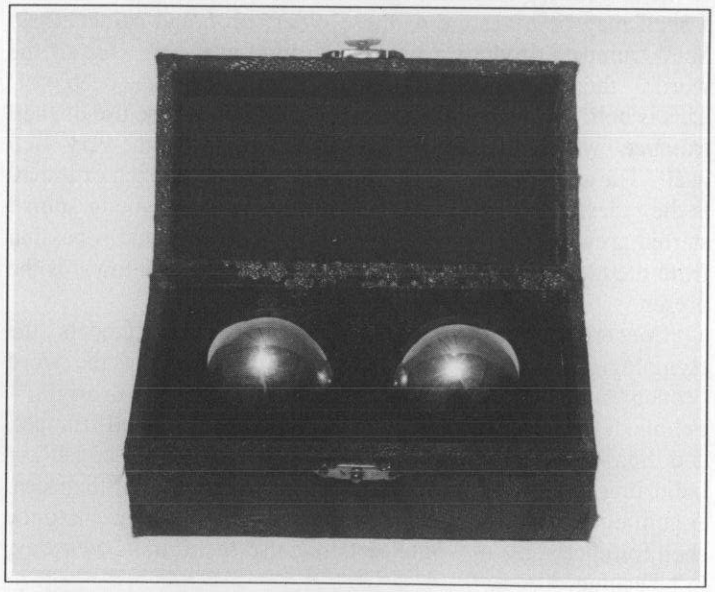


Figure 3. *Baoding* balls (the ringing "Health Balls" which are a specialty of Baoding, China, and which may be had inexpensively in Chinatown, San Francisco, these days), the chiming vibrations of which can help soothe the aching hand that did the filing of a shell trumpet. The name *shouqiu* (literally, "hand ball") is sometimes used for these sealed, spherical pellet bells.

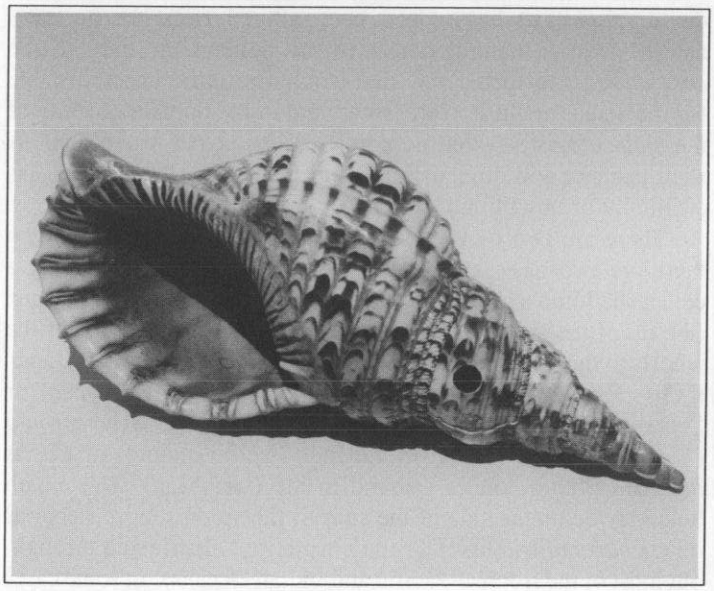


Figure 4. A side-blown shell trumpet made by the author from a *Charonia tritonis* ("Triton's trumpet"); length 11", pitch E_4 (open) or as low as C_4 (hand-stopped). (Photograph taken during the process of construction, i.e., the mouth hole is slightly smaller than in the final instrument.)

The details of their exact purposes remain a mystery.[14]

Generally a shell trumpet is used to produce one note; harmonics are possible but seldom utilized. One exception is the Japanese *hora,* where three, sometimes even four, pitches of the harmonic series may be employed.[15] On the end-blown Fijian shell trumpet made from the *Bursa bubo* ("giant frog shell"), there is a fingerhole which will allow for a whole-tone change in pitch.[16] Shell trumpets with several fingerholes have also been explored.[17] Occasionally pitch is modified by the player inserting his or her hand into the aperture. Although shell trumpets would seem to lend themselves to being played in a musical context in homogenous ensembles, along the lines of ensembles of panpipes and stamping tubes in Oceania (particularly Melanesia), such an approach is actually very rare. Tonga (in Polynesia) is the only place where conch ensembles have been found, and then only in the more remote areas (some of the northern islands) and only in a few musical contexts (for recreation and for cricket matches).[18] In contemporary music and jazz, however, ensembles of shell trumpets have been used by trombonists Stuart Dempster and Steve Turre.

Now, to get to work. I've made a few shell trumpets with the mouth hole at the apex. A simple basic recipe is:

Ingredients:

The shell of a large univalve gastropod
A file
Jeweler's files for finishing work (optional)

Procedure:

File off the tip of the spire.
Smooth out the perimeter of the hole (optional).

That's it. But to be more specific: from my experience, for making a shell trumpet it seems that a conch of some size — something like six - seven inches or greater in length — is needed. My attempt at making an instrument with the shell of a young *Strombus gigas* (perhaps five inches long) did not work out: I just couldn't get a sound out of the thing. Perhaps a smaller shell such as that might work with a mouthpiece. I've made end-blown trumpets from *Cassis cornuta* (my shell of choice; see Figures 1 & 2), *Cassis tuberosa,* and adult *Strombus gigas*. My construction approach with the *Cassis* has been to file off the tip with an 8" mill bastard file and a lot of elbow grease, getting it to the point where the opening is about 5/8" in diameter. With the jeweler's files, I'll smooth down the insides of the opening. For a *Strombus gigas,* which has a steeper spire, I first cut off an inch or so of the tip with a saw, and then proceeded as with the *Cassis*.

It is certainly possible to get the job done more quickly. A friend once made a trumpet from a *Strombus gigas* by forcibly breaking off the tip — he's a percussionist — with little or no filing. In this case, it appears that the irregularities of the edge of the mouth hole allowed for a more pronounced array of upper partials to the shell trumpet's tone. To remove the tip of a *Strombus gigas,* D.Z. Crookes (describing the process in his "How to make a shelly hautbois") supported the shell's tip "on an anvil, and nipped it off with a cold chisel," later carving a "half-civilized" mouthpiece.[19] I suppose one could also use a power grinder or sander to quickly get through the early stage on a *Cassis,* for instance, but I think a couple of hours or so of manual filing is not too big a price to pay (however, see Figure 3). Of course, being physically involved with the stages of the manufacture of a shell trumpet, as with any musical instrument, increases one's connection with the instrument and its sounds.

As regards side-blown shell trumpets, I've made one, from a *Charonia tritonis* (see Figure 4). For such a shell, a basic recipe is:

Ingredients:

The shell of a large conch with a steep spire, especially a *Charonia tritonis*
A drill
Jeweler's files for expanding the hole and for finishing work

Procedure:

Drill a small hole into the side of the spire.
Expand the size of the hole and smooth out the edges.

Again, a little more detail. I placed the hole in the second whorl out from, and on the same side of the spire as, the aperture. With this arrangement the aperture faces backwards from the player when the trumpet is played. I used photographs of side-blown *Charonia tritonis* as my guide.[20] I used a drill bit of about 1/8" diameter to get the hole started and then followed with a 1/4" bit. I expanded the hole to about 5/8" with a half-round jeweler's file. A larger rat-tail file would also be possible (although one needs to be careful of a bulkier tool damaging the interior of the shell), before following up with the jeweler's file.

Although I've made a few shell trumpets, I have not yet made musical use of them in any *concerted* way. I do have a piece — forthcoming in my series of *Anthems* for ensembles of "peacefully co-existing" sustained sounds — for a plurality of shell trumpets and pre-recorded tape. Also, when you've got a shell trumpet around, blowing it every once in a while does impress neighbors and passers-by alike.

Again, these are the most basic of recipes. I look forward to other writers who have more background in the individual traditions of shell trumpets, and who are more acquainted with the acoustics and detailed construction,[21] to contribute further on the subject of these fascinating instruments.

ENDNOTES

1. Despite the fact that a large conch does need to be modified to make a trumpet, a small snail shell can be used, unmodified, as a whistle. An intact snail shell is essentially a stopped pipe, and if the aperture is of an appropriate size — so the player is able to create an embouchure — the shell can be an effective whistle. Unaltered large conch shells filled with water were used for their gurgling sounds by John Cage in his pieces *Inlets* (1977, which also makes use of a shell trumpet) and *Two*[3] (1991, which also includes a Japanese *shô* reed organ). A single such large water-filled conch was used by the present author in his *"concerning an aspect..."* (1988).

2. In general usage, the word "conch" describes large spiral univalve gastropods even when it is not referring to what is, strictly speaking, a *conch* (the "true conchs" are members of the genus *Strombus*). This seems to be especially true in relation to shell trumpets, where the term "conch trumpet" is used quite freely.

3. Richard M. Moyle, *Polynesian Sound-producing Instruments* (Princes Risborough, England: Shire Publications, 1990), 39 and figure 25, which shows several side-blown *tritonis* being played in Tonga.

4. Richard M. Moyle, *Polynesian Sound-producing Instruments,* 39 and

lower portion of figure 23.

5. Te Rangi Hiroa (Peter H. Buck), *Arts and Crafts of Hawaii, IX: Musical Instruments* (Honolulu: Bishop Museum Press, 1957, reprinted 1964), figure 256 a.

6. Chang Sa-hun, *Uri yet Akki* ("Our Traditional Musical Instruments"; Seoul: Daewonsa, 1990), 31.

7. Hajime Fukui, "The *Hora* (Conch Trumpet) of Japan" in *Galpin Society Journal* 47 (1994): 47-62, where several photographs and a diagram of the mouthpiece are shown. For a full-size color photograph of a *hora,* see Jane Fearer Safer and Frances McLaughlin Gill, *Spirals from the Sea: An Anthropological look at Shells* (New York: Clarkson N. Potter, Inc., 1982), 174-5. Concerning the *hora*, one of its less-documented uses is in a rite called *Shunie* associated with the Tôdai-ji Temple in Nara (see Hajime Fukui's essay, 52). A shell-trumpet ensemble portion of the *Shunie* can be heard on the album *Harmony of Japanese Music,* mentioned in the attached discography.

8. Note that terminology relating to the human ear is rich in shell imagery. The *cochlea* (a Latin word derived from the Greek *kokhlos,* land snail) is the spiral, shell-shaped portion of the inner ear which transmits the signals to the brain which are interpreted as sound. As a word referring to a shell-like structure, *concha* (from the Greek *konkhe* — a shell-bearing mollusk in general — which, via Latin, is an ancestral form of "conch") is a term used to describe the human external ear, also known as *pinna.* And *pinna,* from the Latin word for "wing" or "feather," is also the name for a genus of large — and wing- or feather-shaped — bivalve mollusks (family *Pinnidae*).

9. John M. Schechter and Mervyn McLean, "Conch-shell trumpet" in Stanley Sadie, ed., *The New Grove Dictionary of Musical Instruments* (London: Macmillan & New York: Grove's Dictionaries of Music, Inc. 1984), I:461. Note that it is conjectured that the earliest use of the instrument was as a voice modifier — a megaphone of sorts.

10. Eric Partridge, *Origins: A Short Etymological Dictionary of Modern English* (2nd edition, New York: Macmillan, 1959), 114. Note especially one Middle English spelling, *conk.*

11. A recorded example of the former use, from Chuuk, Micronesia, is included on the album *Spirit of Micronesia,* mentioned in the attached discography. The latter use is mentioned in the entry for the shell trumpet *ntuantuangi,* of the Poso Toradja of Celebes, in Sibyl Marcuse, *Musical Instruments: A Comprehensive Dictionary* (2nd edition, New York & London: W.W. Norton & Co., 1975), 368.

12. Note that the Sanskrit word *shanka* (which may be romanized in various ways, with or without diacritics; the English common name for the shell is "chank") does share the same Indo-European root as *konkhe,* and ultimately, "conch." The Latin scientific name for the *shanka* is *Turbinella pyrum.*

13. See Safer and Gill, *Spirals from the Sea,* 176-7, for two views of a specimen dated 1400.

14. Jeremy Montagu, "The conch in prehistory: pottery, stone and natural" in *World Archaeology* 12/3 (1981): 273-9, which focuses on these shell-trumpet skeuomorphs.

15. Hajime Fukui "The *Hora* (Conch Trumpet) of Japan," 51-2.

16. Moyle, *Polynesian Sound-producing Instruments,* 39 and figure 24.

17. D.Z. Crookes, "How to make a shelly hautbois" in *FoMRHI Quarterly* 80 (July 1995): 43, where he experiments with up to seven (?) fingerholes on *Strombus gigas.*

18. Richard M. Moyle, "Conch Ensemble: Tonga's Unique Contribution to Polynesian Organology" in *Galpin Society Journal* 28 (1975): 98-106. Also, his *Polynesian Sound-producing Instruments,* 41-2 and figure 25. Ensembles of three to seven, or more, side-blown *Charonia tritonis* are used.

19. Crookes, "How to make a shelly hautbois," 43.

20. For instance, Eric Metzgar, *Arts of Micronesia* (Long Beach, Calif.: FHP Hippodrome Gallery, 1987 {exhibition catalogue}), figure G, and Safer and Gill, *Spirals from the Sea,* 168.

21. See Montagu, "The conch in prehistory: pottery, stone and natural," 274-5, for a brief discussion of shell-trumpet acoustics which outlines some of the basic issues. Concerning shell-trumpet construction, note that Hajime Fukui's "The *Hora* (Conch Trumpet) of Japan" goes into a great amount of detail concerning making this particular instrument.

SOME SHELL TRUMPET DISCOGRAPHY

Following is a handful of recordings which include shell trumpets. Occasionally recordings of shell trumpets will appear on collections of music from Oceania. An example is *Spirit of Micronesia* (Saydisc CD-SDL 414), which includes a conche (note this alternate spelling) introducing two chants (track 20) and a conche used for warding off storm clouds (track 22; a photo on page 20 of the booklet shows a player of a trumpet made from a *Cassis* species). Though brief, this latter track beautifully captures, against a backdrop of storm waves, the shell trumpet's evocative qualities. Pan Records' *Fa'a-Samoa: The Samoan way... between conch shell and disco* (PAN 2066CD) includes a recording (track 1) of a conch-shell *pu* being used to announce curfew; on track 13, an animal horn used for the same purpose is also called *pu*. (The "disco" of the title is actually a brass band performance.) Another album on Pan, *Tuvalu: A Polynesian Atoll Society* (PAN 2055CD), has an impressive photograph of a shell-trumpet player on the cover, but does not include any shell-trumpet recordings.

A Japanese Buddhist ritual-music use of shell trumpets — as part of *O-Mizu Tori* ("a water-drawing rite") of the *Shunie* rite at Tôdai-ji Temple, Nara — may be heard on *Harmony of Japanese Music* (King Records [Japan] KICH 2021).

Steve Turre's *Sanctified Shells* (Antilles 314 514 186-2) and Stuart Dempster's *Underground Overlays from the Cistern Chapel* (New Albion NA076) include some contemporary creative uses of shell trumpets in ensemble. Colin Offord's *Pacific Sound* (Move Records [Australia] MD 3 105) makes use of shell trumpets in ensemble with instruments of his own construction. Together with other sound-makers made of shells, a shell trumpet may be heard on the track "Sea Language" on The Art of Primitive Sound's *Musical Instruments from Prehistory* (Hic Sunt Leones [Italy] HSL 003).

—MC

THE BRAIN, PROCESS MODEL AND OTHER PHENOMENA

By Grant Strombeck

"Invention presupposes imagination but should not be confused with it. For the act of invention implies the necessity of a lucky find and of achieving full realization of this find. What we imagine does not necessarily take on a concrete form and may remain in a state of virtuality, whereas invention is not conceivable apart from its actually being worked out." — Igor Stravinsky, Poetics of Music

Recently I came up with an idea for making an instrument. I started the project by gathering various found materials. Springs, metal, wooden parts and junk of all kinds ended up in my basement spread out all over my disorderly workbench. The idea was just an abstract concept in the form of a mental map. I was all set and ready to go, but I did not have a sketch or a blueprint. I was ready to start work without a formal design plan and I had made no attempt to assess the potential problems that could occur during the build stage.

Sound familiar? Is this the way you start your projects, or are you systematic and methodical? Do you plan ahead? Take accurate measurements? Draw diagrams? Plot your process flow?

I have been trying to find ways to get beyond my resistance to better organization. I've also been wondering, or trying to find excuses, why I am predisposed to aimless methods and emotional impulses.

Nobel prize winner Roger Sperry initiated a study of the relationship of the two sides of the human brain. Sperry found that the right hemisphere of the brain and the left hemisphere of the brain operate in different ways. The right half makes use of intuitive insights and emotional inputs while the left half tends to function in an analytical, rational and logical manner. Sperry's brain hemisphere dominance theory may well apply to instrument makers.

Instrument making, by its very nature, covers a broad range of concepts, tools, and techniques. Some of these concepts, tools, and techniques are clearly in the left brain arena, such as mechanical drawings, tuning ratios, shop math and the shop skills required in the use of tools and materials. Others are in the right brain arena, such as visual relationships, recognition of sonic qualities, freedom to experiment, intuition and creativity.

When working on projects, like most people, I tend to cling to my comfortable thinking processes. When I am looking at an object, I might ask: What is the way this thing is *not*? I might wonder: What would it say to me if it could talk or make sounds? As a musician, with a jazz background, I'm comfortable while improvising. I like to play with sounds and to discover the sonic properties in materials, but I do not like to plan and detail out mechanical things. I like to experiment, distort and invert, but I'd rather not organize, square-off, grind and polish. Clinging to my comfort zones, I'm in a thinking process rut. If I could harness the power of the left brain I might surprise myself, but identifying ways to do so is another matter.

It seems clear that the effective harnessing of both sides of the brain's thinking processes would allow one to shift from one thinking process to another as the situation warrants. For example, right brain thinking could go into action to visualize and audio-ize a fine-sounding fantasy instrument while the left brain thinking could plan a solution for the design and development of a working instrument. With whole-brain thinking the process of making instruments is obviously a process of art and science. It is likely that the best instrument makers, whether they are conscious of it or not, are operating as whole-brain thinkers. Most of us, I would guess, are dominated by one hemisphere or the other. Those of you who are left-brain thinkers will probably want more evidence of the brain-dominance theory. You might even be wondering if any objective and certified brain tests have been conducted on instrument makers. If you are a right-brain thinker you will be prone to intuitively grasp or reject the whole concept.

Regardless of whether I accept or reject this established and somewhat schizoid theory there is always a need for me to be cognizant of my strengths and weaknesses. An awareness of my inner process and the control of my creative process-flow is key to my instrument making expectations.

WHAT ARE THE EXPECTATIONS?

The output of my projects rarely meet my expectations. The good news, however, is that I make instruments for fun and not for profit. My expectations are rarely met because my work habits are so right-brain dominated that projects are begun before the process is described. In recognizing my shortcomings I am now making an effort to adjust my right-brain orientation to left-brain thinking. I have started to use a well known industry process model. I have found that this model helps me to organize my projects. It is simple to use and easy to understand. If you are a right-brain thinker you might find this model useful.

PROCESS MODEL

The first thing any process needs is a description, but before I talk about the process model itself there are two important ideas about work that should be introduced.

The first idea is that *all work is a process*. A process, on the other hand, may not be work. Breathing is a process, but not necessarily work. All work is a process because all work produces

Photographs on these pages

INSTRUMENTS BY GRANT STROMBECK

Below left: Terminal Paper Gourd Harp

Electronic terminals fastened to a paper gourd with springs woven into the terminals. Similar to a stringed instrument, it produces delicate harp-like sounds with some interesting low frequencies.

Top right: Jawlimba

A wooden resonator with a strip of copper tongues and adjustable wooden pegs under the tongues. Sounds more like a jaw harp than a kalimba.

Center right: Old Piano-String Drum

Piano wire attached to the skin of an old drum. Sounds like a wind storm with drums and rattles.

Below right: Flexy-Protuberance

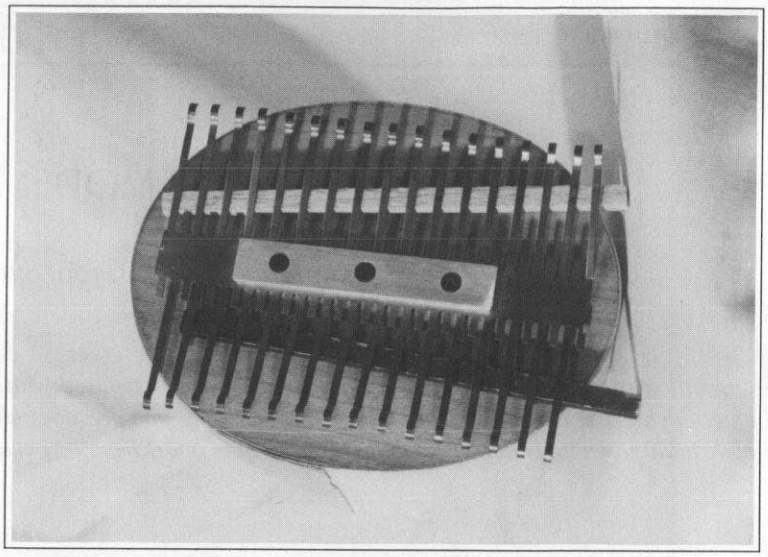
A set of beryllium copper strips mounted on a rectangular frame with springs woven into the tines of the strips. This instrument sounds like a ratchet or a motor when hooked up to a flange effect.

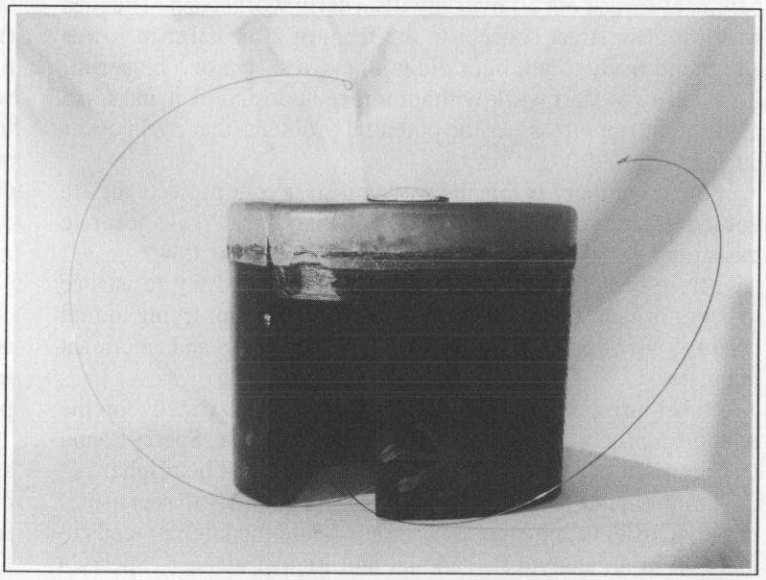
Facing page top: Clock Chimes Plus

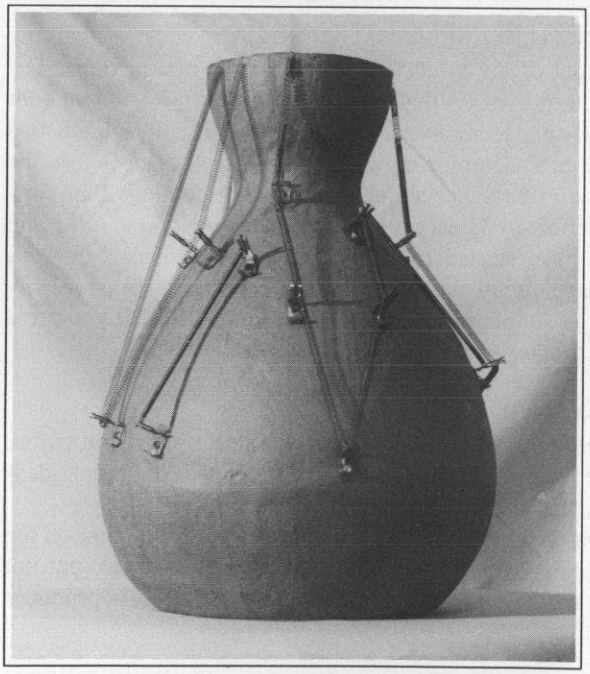
Various lengths of grandfather clock chimes attached on a crescent-shaped rack. The instrument can be bowed or struck. There is pan-gong mounted below the chimes and long steel tongues mounted upward. The whole effect can range from sweet tonal bells to high pitched screams, rattles, gongs and low groans.

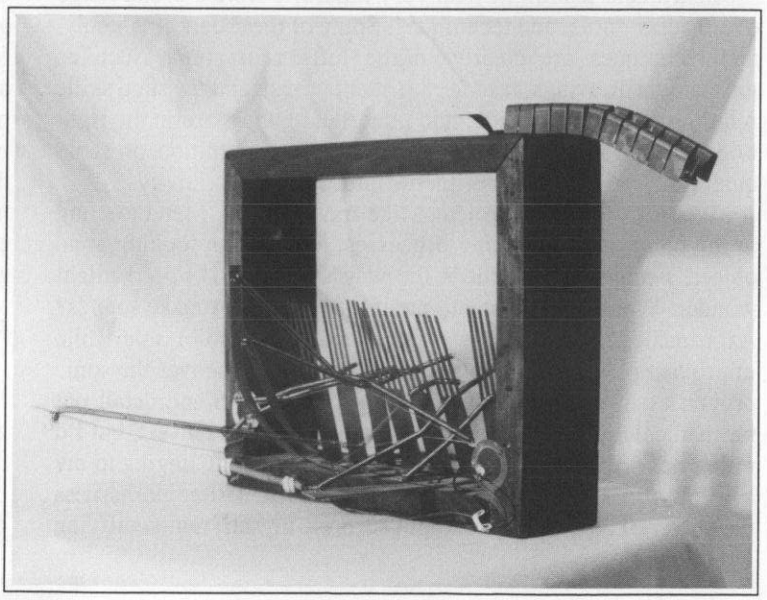
Facing page below: Wobble-Bell

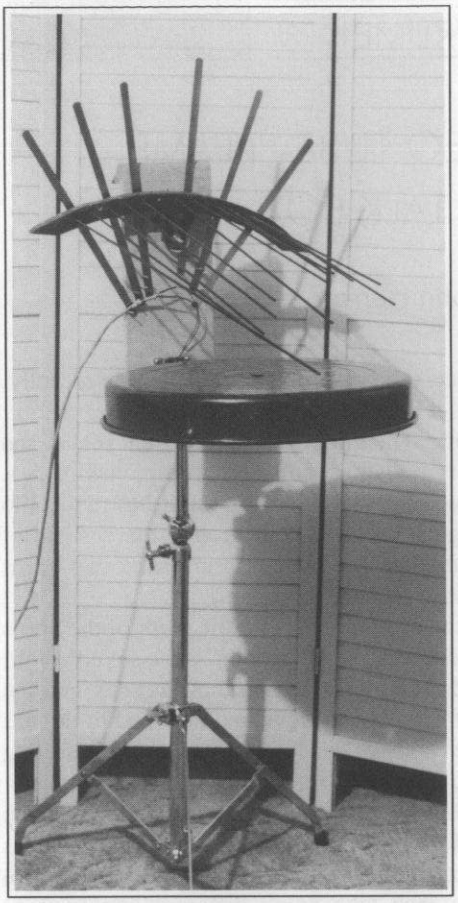
This is a crotale loosely mounted on a copper tube can. When hit with a soft beater it wobbles and makes bird-like sounds.

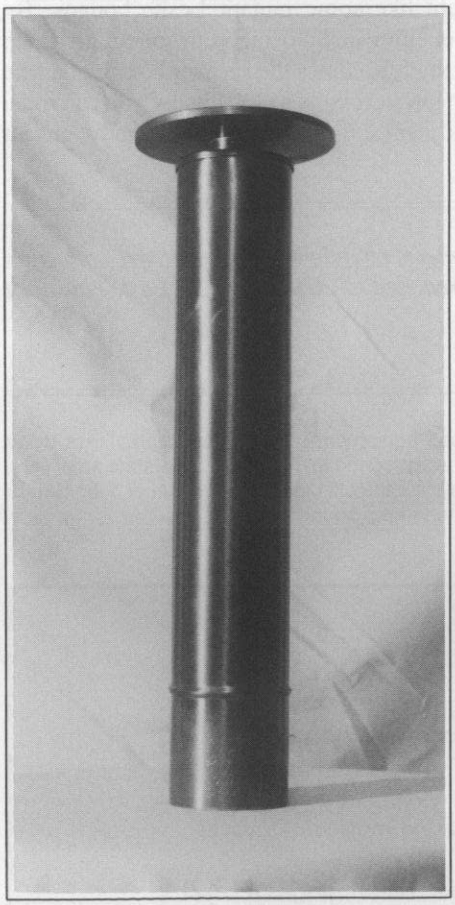












something to be used. An experimental instrument, music, a magazine, or perhaps, just a thought. The "*something*" is the output of the process.

The second idea is that *all work has a customer*. The customer is the person or persons who use the output of the work. In my case I am both the producer and the customer. One might argue that anyone listening to my instrument is the end-customer. But for the purpose here I will identify myself as the customer.

The customer has certain expectations that can be viewed as the output requirements of a process. Let's say I have decided to make an experimental instrument with clock chimes. The first step is to define the process. I will define it as: Building A Holder for Grandfather Clock Chimes. The next step is to identify the customer output requirements.

The output requirements are the words that fully describe what the customer wants.

OUTPUT REQUIREMENTS

1. Clock chimes mounted on a sturdy curved rack.
2. Rack mounted to a stand for performance.
3. Clock chimes set so that they can be played with a bow or mallets.
4. Portable.
5. Pick-ups mounted to chime rack.
6. Ready in time for my May 15th concert.
7. It does not have to look perfect, but it should sound good.

Once the process has been described and the customer output requirements defined the next step is to state the exact scope of the process I am modeling. The scope of the process is a statement of all the actions directly needed to produce the output. Stating the scope of a process is an important key to succeeding with developing a process model.

SCOPE

1. Locate suppliers and obtain materials within one week.
2. Make arrangements with Joe for using his band saw.
3. Ask Joe to show me how to layout the rack before cutting and drilling.
4. Assemble parts.
5. Complete the project by May 10th.

Once the scope has been stated and the output requirements defined, I complete the model by identifying inputs and defining the requirements for each input. The inputs are those thing needed to produce the output requirements.

INPUT	INPUT REQUIREMENTS
1. 14 Clock chimes.	Various lengths from grandfather clocks.
2. Steel plate.	One-half inch thick. 15"x 4"
3. Equipment.	Drills and taps for 6-32 UNC 2B threads.
4. Training and knowledge.	Get help from Joe.
5. Facilities and tools.	Clean workbench and make sure tools are working.
6. Performance standard.	Must sound good.
7. Pick-ups.	2 Piezo transducers, two cables and 1/4 inch phono jacks.
8. Rough sketch.	Blue die and scribe steel plate.
9. Cost.	Fifty-two dollars.
10. Measurement tools.	Joe's height gage, angle plate and calipers.
11. Stand.	Old drum stand up in the attic.
13. Mounting board.	Ply wood. One-half inch thick. 12"x 6"

This industry process model has a customer focus goal that requires one to channel action and right-brain thinking to achieve the output requirements of the customer/user. It is a tool but by no means is it a method to replace the value of creative, poetic, intuitive thinking. During the actual building process one thing may lead to another and the final

output may not match the process model intent. The project could very well exceed the customers expectations. The idea is to get the whole-brain working. Unfortunately, this article does not offer much for the left-brain thinkers. Left-brain dominant persons may need to explore ways to un-lock their intuitive, emotional, feminine and creative side.

Ultimately, I am not sure where creative ideas and intuition come from. I get the feeling that somehow they exist before they are realized. They are somehow incubating, or existing in a kind of alive but dormant *off-place* waiting to get turned on. Then, by some means, comes a flash of insight or a sudden discovery, like finding something when you're not looking for it. It's amazing what you get from nothing at all.

I've noticed my best creative ideas seem to pop up when I'm stuck in traffic. Traffic is a place where conditions make it impossible to actualize ones ideas. What is it about traffic? Is there an opportunity to learn something in traffic? Is the alternation of stuck and un-stuck a part of the right-brain process? Is this where the left-brain dominants should start to practice? Who knows? I'm not qualified to say.

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Grant Strombeck is a Chicago-based drummer, improviser, composer and multi-instrumentalist. Some of his invented instruments can be heard on Hyperlinks, *a 1996 compact disc.* Hyperlinks *is a collection of Strombeck's experimental sound works, improvisations and compositions. The CD is available for $12.00 plus $2.00 M/H. Check or money order payable to Grant Strombeck, Tsunami Productions, 2237 Grove, Berwyn, IL 60402. Grant can be reached at (708) 788-1152. Tapes are also available; please write for information on tapes.*

INSTRUMENTS

MY EASY STEREO TUBE-PREAMP, LESLIE TALK BOX

by John Herron

I found an old Norelco reel-to-reel tape recorder at a garage sale recently. After a bit of dickering, I purchased it for five dollars. It's a fairly heavy unit, chock full of tubes, all of which work! The thing was kept in great shape, and after carefully cleaning the heads, I started doing some recording, making tape loops, and playing my synths through the audio ins. The unit has two audio outs, so I can preamp whatever signal I send into it through the warmth of tubes.* It also has two speaker outs that I've ended up inserting two horns into (Radio Shack #40-1228, 2x6 60-watt horn Tweeters).

I mounted both horns onto a piece of Plexiglas with the front of the horns facing the glass. Why mount them that way? That just blocks the sound! Well, I'd found some flexible, corrugated 7/8" plastic tubing that fits snug into the horns' throat. With the horns mounted against Plexiglas, all I had to do was cut a 7/8" hole in the glass where the center of the horn throat was. By inserting the plastic tube through the hole and into the horn, my new toy was complete. I made the two plastic tubes about 9 feet long. When I play sound through the horns, most sound is forced through the tubes, allowing me to swing the tubes around, creating a great Leslie effect with very little effort. It's easy to control the speed, change directions, have each tube going different directions or speeds. By mounting the tubes on a stand where the open ends are upright, you can use your hands across them like some mutant Leslie bongos. By inserting a tube end in your mouth, opening and closing your mouth gives the classic talk box sound where your mouth becomes the speaker box. Use a Mic near your mouth to amplify whatever fun stuff comes out. Finally you can route the tubes into buckets of water, stick them into pianos, or use them as mutant headphones.

John Herron's many original instruments complement his extensive collection of ethnic instruments. John can be reached at 365 South 544 East, Salt Lake City, UT 84106.

*For those not familiar with vintage sound equipment: Old-fashioned amplifiers using vacuum tubes are considered to have a warmer sound than modern solid-state amplifiers. By using the vacuum tube pre-amplifier built into the old tape recorder, author John Herron was able to take advantage of its classic tube-amp sound.

THE MONOLITH

A Two-Dimensional Keyboard for Pitch and Timbre

by Jacob Duringer

Editor's Introduction: An essential part of the personality and musical potential for any musical instrument is the nature of the interface between the instrument and its player. For keyboard instruments, the traditional form for the interface has been the piano's familiar 7-5 arrangement — seven white and five black keys per octave. This layout has served well for several centuries, having a special affinity with the European classical music in connection with which it evolved. But the time has long been ripe for exploration of other possibilities in keyboard design. A number of designers over the years have taken on the question of alternative keyboard layouts. Often enough they have produced systems with real advantages, both conceptual and physical, though their designs have not been widely adopted. Several such alternative keyboard layouts were discussed in *EMI* Volume II # 5 (Feb 1987). With the information on Jacob Duringer's *Monolith* that follows here, we touch on the subject again. Geary Thompson's article on quartal keyboard arrangements, also appearing in this issue, explores yet another approach.

Jacob Duringer designed the Monolith as a MIDI synthesizer controller,* in the form of a two-dimensional array of square, button-like keys. The pitch-layout is fairly conventional: along the horizontal axis, the Monolith adheres to the standard 7-5 pattern of black and white keys. This is in keeping with a decision on Duringer's part to keep the layout accessible to players already trained on the standard keyboard. Where the Monolith is distinctive is in the vertical axis of its two-dimensional array. The vertical component controls not pitch, but timbre, with each level bringing out a different tone quality. Just what those tone qualities are is a matter of what's available in the synthesizer to which the Monolith is attached, and how the player chooses to assign the available synthesizer voices to different MIDI channels. (The process of assigning different synth voices to specific channels is a familiar routine for electronic musicians in the world of MIDI.)

The ability to move between different synthesizer voices is nothing new. What is new is bringing the capacity for many voices together in a single keyboard with the Monolith's fluidity and logical coherence. Jacob Duringer sees in it some liberating possibilities. His article begins at right.

*(MIDI = Musical Instrument Digital Interface — the standardized electronic code that allows today's synthesizers and computer music systems to talk to each other. The word "controller" refers to whatever it is that the musician uses to control the synthesizer — typically, a keyboard.)

Allow me to introduce a brand new musical instrument; a two-dimensional MIDI keyboard controller for performance and composition applications. This keyboard allows the performer to control multiple channels of MIDI information simultaneously, which means that a performer can play arrangements of many different instrumental sounds strictly by his or her own skill and imagination, a feat much dreamed about but never realized until now.

The secret to the keyboard's ability is in its arrangement of multiple rows of keys placed side by side yet retaining the chromatic scale layout and key-to-key distances of the standard piano keyboard. With this multiple-row arrangement, the player may assign different fingers to different rows which correspond to different MIDI channels which are programmed to reproduce different musical tone qualities. Entire symphonic arrangements can be performed live without the use of artificial accompaniment such as sequencing, layering, dubbing or programming. The result is an instrument that empowers the performer with its greater capacities, and that will challenge the imagination and skills of even the most advanced musicians.

The Monolith has fifteen rows of keys, one above the other. Each row has forty-eight keys, for a range within the row of four octaves. Each row can be assigned to a different MIDI channel, so the player can control up to fifteen different instrument tone qualities at once. The individual keys are about the size of a thumb tip, rather than being two or three inches long as on the piano. Within each row all the keys are uniformly spaced in a single line at the same level, black and white keys side by side, rather than having some raised and some recessed. This facilitates the player's access from key to key, especially in the vertical direction. It also simplifies the learning of fingerings, as well as the transposition of music from one key to another, because fingering patterns are identical in all keys.

I have always loved electronic music, but I was frustrated with the live-performance limitations of existing synthesizers, so I decided to investigate what could be done about it. I found that the piano keyboard was limiting the capabilities of synthesizers. What was needed was a keyboard designed for electronic music. The piano keyboard was not designed to play multi-timbral music. It is a one-dimensional instrument. There have been attempts to make the piano keyboard capable of multi-timbral performance by segregating octaves for different timbres, but this method destroys the fluidity of the playing range and only allows one or two different timbres to be played simultaneously. The fact is, the traditional piano keyboard will never be able to perform multi-timbral music except by falling back on pre-programmed accompaniment systems, which means that live performance strictly by an individual's skill is simply not possible. With the Monolith, a world of possibility in multi-timbral performance opens up.

I have been working on this project for twenty years, first with

analog electronics and then with digital. Not until recently, however, has the Monolith been commercially feasible. A few years ago, digital signal-processor-based synthesizers became available which allowed simultaneous access to all sixteen MIDI channels for very reasonable prices.

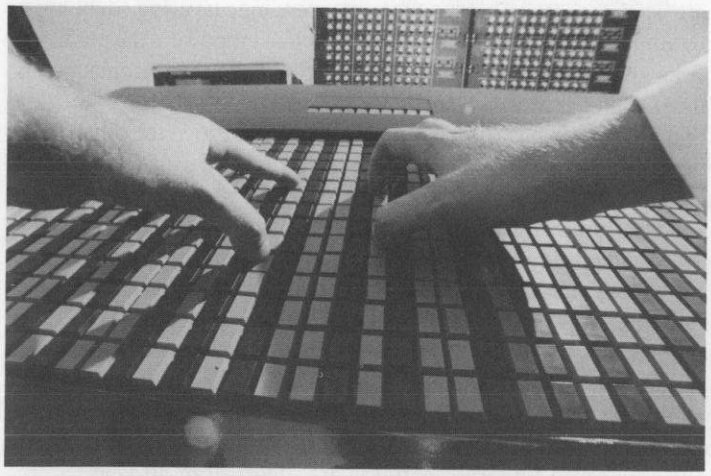
The whole idea behind the Monolith was to allow live performances of electronic music or arrangements, and to allow the public to share in the incredible music possible from synthesizers and synthesists.

The Monolith is available from Heavenbound Systems Engineering Group located in Mission Viejo, California. Patents have been applied for, and all rights are reserved.

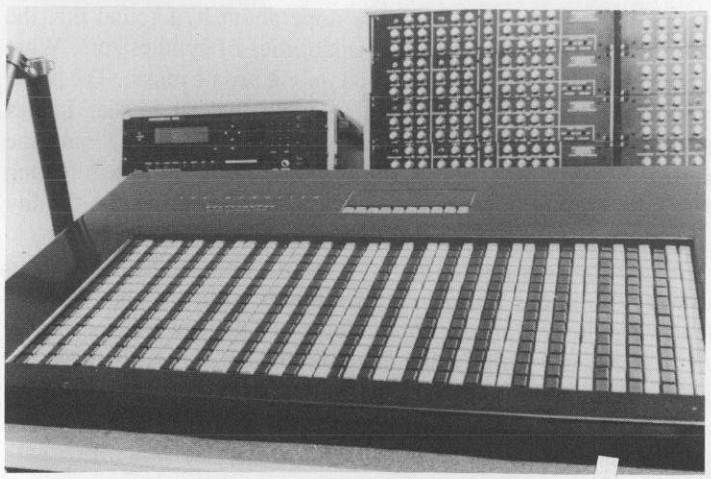
The Monolith is ready to be produced and in very limited production quantities the price should be around $4500.00. In higher production quantities the price will probably be below $2,000.

A Compact Disk is available featuring performances of the Monolith in a jazz-rock-classical trio of electric guitar, drums and Monolith. The music was composed by Jacob Duringer. To order send $10 (California residents add sales tax ($10.78 total with tax) check or money order payable to: Heavenbound Systems Engineering Group, 24331 Muirlands Blvd. P.O. Box #4-127 Lake Forest, Ca. 92630; Phone/Fax (714) 487-2251.

Jacob Duringer is a Southern California aerospace engineer, composer and inventor.



The Monolith



THE QUARTAL SYSTEM
The Introduction of the Two-dimensional Musical Keyboard

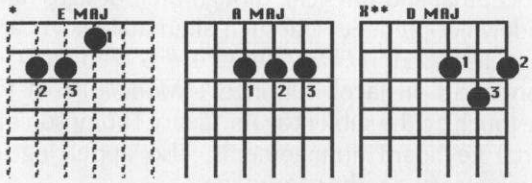
by Geary Thompson

The quartal system is a concept for a two-dimensional pitch-layout system. On these pages Geary Thompson presents the Quartal System in two forms: first as it would be realized as a guitar tuning, and second as a keyboard.

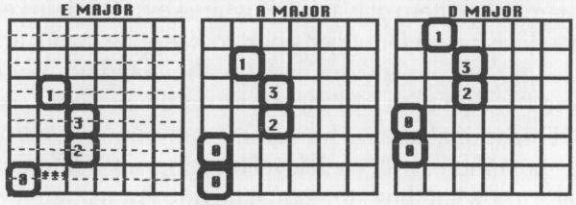
QUARTAL GUITAR

The quartal guitar is simply a guitar tuned in fourths (E, A, D, G, C, F). All chords and scales move in parallel patterns along the neck (like the barred chords of standard tuning) as well as across the neck.

Standard Tuning (Figure 1)



Quartal Tuning (Figure 2) (By laying this diagram sideways, the patterns are still readable; however, now they are relatable to the quartal board).



*** A string with no fingering or X marking is played open.**

**** Do not play string marked with X.**

***** A quartal guitar diagram indicates every note played.**

0 indicates an open string.

ADVANTAGES

UNIFORMITY

Learning is greatly facilitated, because of the use of uniform scale and chord patterns.

The evenly delineated grid allows music to be abstracted to and from two-dimensional geometric patterns.

Reading notation is made easier and more logical.

Improvisation becomes easier due to this even note distribution, which allows the performer to think more quickly.

CONFORMITY

All guitar styles are playable.

As with traditional tuning, initial learning from geometric patterns becomes greatly facilitated.

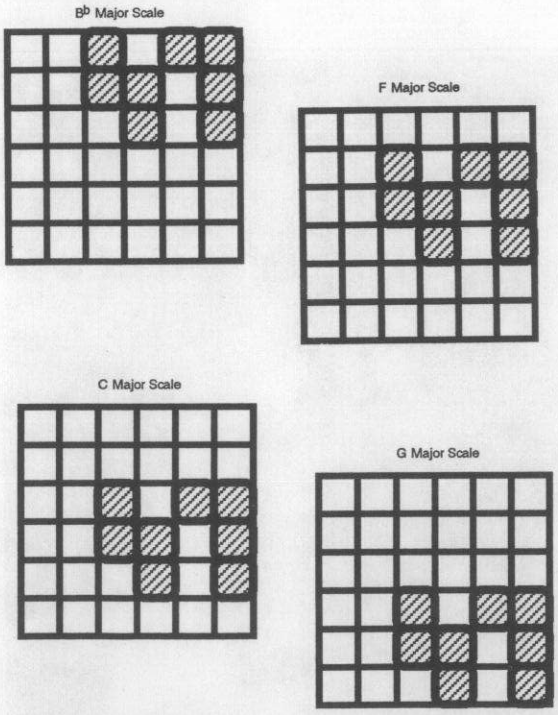
All written Literature for standard tuning is adaptable to quartal tuning.

I have had over thirty years experience playing quartal guitar (since 1962). Because of the lack of specific methods and collections, my playing and practice have been focused on proving the fourth tuning, rather than concert performance — it does work!

Jazz and other improvisation have been the easiest idioms to assimilate, while acquiring a classical repertoire has been the most challenging. Most classical guitar literature is fully playable with this tuning.

On an experimental basis, anyone can raise the 2nd and 1st strings to C and F, and try the patterns displayed in this article.

MAJOR SCALES (Figure 3) — G, C, F, Bb



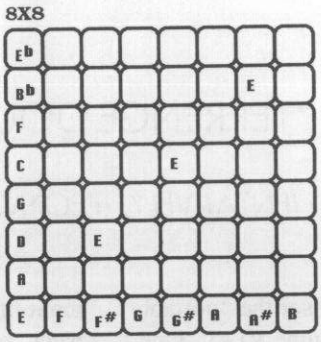
QUARTAL BOARD

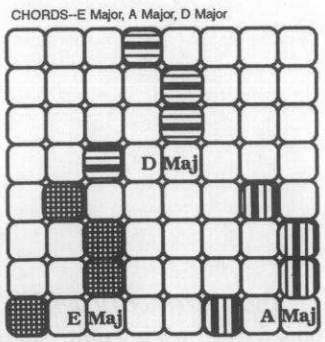
Two-Dimensional Keyboard Design

The quartal board is a simple mental projection of the guitar tuned in fourths (quartal guitar). The horizontal rows are aligned in half-steps and the vertical rows are aligned in perfect fourths. All chords and scales move in parallel patterns (key to key) vertically and horizontally.

QUARTAL BOARD (Figure 4)

and CHORD PATTERNS for Quartal Board (Figure 5)





ADVANTAGES

UNIFORMITY

Learning is greatly facilitated, because of the use of uniform scale and chord patterns.

The evenly delineated grid allows music to be abstracted to and from two-dimensional geometric patterns.

Reading notation is made easier and more logical.

Improvisation becomes easier due to this even note distribution, which allows the performer to think more quickly from key to key.

CONFORMITY

All piano/organ literature and methodology are adaptable to the quartal board.

Learning from geometric patterns becomes greatly facilitated.

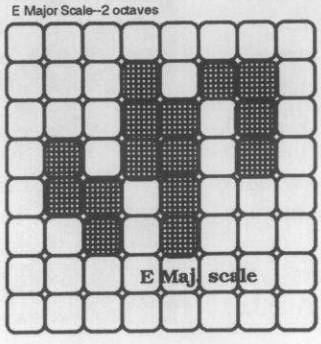
The evenly aligned grid reinforces a chromatic approach to learning.

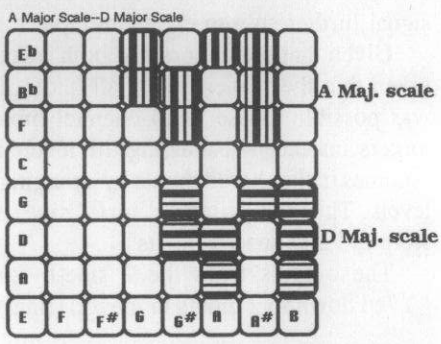
I have had over twenty years experience experimenting with the quartal board (since 1974). Because of the lack of specific methods and collections, my playing and practice have been focused on proving the quartal concept, rather than concert performance — it does work!

Jazz, and other free and idiomatic improvisation have been easy to assimilate; while acquiring a classical repertoire has been the most challenging. All classic keyboard literature is fully playable with the quartal board. The challenge is the extended single-handed range and flexibility which offers new technical possibilities for 21st century composition and improvisation.

On an experimental basis, anyone can visualize the use of the shown patterns. Playable MIDI control keyboards and introductory methods are available from the author. Starr Instruments and Heavenbound are also manufacturing two-dimensional keyboards.

MAJOR SCALES (Figure 6) — E, A, D





THE "TERRENCE DOUGHERTY"

by tENTATIVELY, a cONVENIENCE

The "*Terrence Dougherty*," like its predecessor the "portable booed usic busking unit" [described in *EMI* Volume VI #1, June, 1990], has been more or less scavenged beyond the point of probable return. As such, I want to write about it before I forget it completely. Its name was taken from the person who was kind enough to give me about half of its components.

The *TD* consisted of a metal frame 4 feet tall by 1 foot 9 inches wide by 10 inches deep. This skeleton was divided into smaller racks built especially to size for specific objects mounted on them & meant to have their controls all accessible from the front. This frame had wheels on the bottom back to make moving it easier.

The bottom rack had a sine/square wave generator. The next rack had another sine/square wave generator which broke & was eventually replaced by various devices — including the *Realistic* version of the SK1 sampling keyboard (the Concertmate 500). Continuing the upward bound description, next came 2 cheap 4-channel mixers. Above these were 4 small tape-player/radios. Three of these had EQ & were auto-reversible; the 4th could record. Next came the "wind" & "surf" units — i.e.: noise generators approximating these sounds. Then there was the Gnome ribbon, knob, & switch controlled synthesizer. Finally, on the top row, was another cheap 4-channel mixer, a primitive "ring-modulator," & a patch bay with 10 stereo inputs, 1 stereo output, & a knob to control which of the inputs became the output.

Perhaps what was most interesting about this conglomeration was the convulutedness of its patching. Each of the tape-player/radios had its stereo outputs split. One stereo signal went into 1 of the side-by-side mixers, the other went to the patch bay. Various combinations were used. E.g.: the left & right of player/radios #s 1 & 2 both went into the correspondingly #ed inputs; however, the left from # 3 & the right from # 4 were fed into input 3 & the opposite went into 4. If each of the tapes channels were a separate mono track, the # of significantly different options obviously increased. One player/radio had its signal further split to create an input for the SK1.

Given that the mixers had both mike & line inputs & given that the player/radios all had volume controls, it was possible to use the 4-channel mixers as 8-channel mixers instead — balancing the levels between the two volumes in the shared inputs by changing the player/radio levels. Thus the "wind," "surf," sine, & square outputs were fed into shared inputs.

The outputs from the 2 side-by-side mixers were "Y"ed down to 2 inputs in the top (final) mixer. Another input of this was taken up by the Gnome. The outputs from the patch bay were fed into the "ring modulator" so that they modulated each other. The resultant mono output went into the last of the final mixer inputs.

The output from the last mixer was then split so that a stereo version of it was fed in as input 5 of the patch bay & the other half of the split was "Y"ed down to mono. This went through a chorus, an analog delay, & a foot volume pedal. Since I usually played the "*Erector Set*" (my percussion rig) simultaneously with the *TD*, the volume pedal was located easily accessible to my drumming position. Therefore, I could either play the *TD* sounds as a "percussive effect" or leave the foot pedal down & manipulate

The author playing the "Terrence Dougherty." Photo by John Berndt

the sounds in a less staccato manner.

The remaining inputs of the patch bay were filled in a variety of ways. Most commonly, I'd attach contact mikes to parts of the *Erector Set* & plug those in. This meant that I could hit a cymbal, e.g., have the patch bay set at the cymbal's contact mike's input (perhaps inter-modulating a split-off output from the final mixer or 1 of the other contact mikes or whatever), & press down the volume pedal to mix in or accent with an effected version of the cymbal.

Four tapes were made especially for use in the *TD*. # 1 was made from records & followed an oblique stream-of-consciousness, & # 2 had 1 side of various sound effects & a side of animal sounds, # 3 was taken almost exclusively from my own tapes, & # 4 was a mixture of my favorites from the preceding.

Thus, # 4 progressed as follows (in abbreviated language): 1. 1st call, 2. kampf (ohne waffen), 3. zersplittern von glas, 4. reintegrated, 5. neoist funeral, 6. robin, 7. eindringendes wasser, 8. whale, 9. over-coats, 10. mag-stock, 11. larynx, 12. ode, 13. battery, 14. 88.1FM, 15. accumulation, 16. fallender baum, 17. Q.T. # 3, 18. loons, 19. touch-tones, 20, brazilian bird, 21. ship's bells, 22. mess call, 23. explosion (metal), 24. mockingbird, 25. grass, 26. Q. T. # 7, 27. chinese gongs, 28. side 2, 29. motorcycles, 30. sick call, 31. zebras, 32. carolina wren, 33. bowling pins, 34. bbc t&c, 35. school call, 36. auscultation, 37. bbc t&c, 38. sea gulls, 39. usic &/or usicality, 40. reintegrated, 41. maschinengewahr, 42. fire call, 43. baltimore oriole, 44. modern siren, 45. side 1, 46. insekten schwarm, 47. small plane starts, 48. pay day, 49. car horns, 50. bbc t&c, 51. funeral march, 52. neoist funeral, 53. water dripping, 54. blitzschlag, 55. water pouring, 56. wir-belsturm, 57. large boats, 58. train stops/bells, 59. zerspringen der windschultz scheiße, 60. larynx, & 61. wildebeeste. All on the 1st side!

The # of possible combinations of sounds was enor-mous. I could have 2 different classical stations playing on 2 of the radios, have the stream-of-consciousness playing, create a simple rhythmic alternation between cat fight & explosion sounds, have drones sounding from the sine & square wave generators & the "wind" & "surf," play a bit on the gnomes & periodically shift the output from the patch-bay. & turn the chorus & delay on & off with my feet — maybe even sampling with the Sk1 & playing a melody with a fragment from the above *or* just bringing in some pre-set combination while I drummed.

Hmm. Too bad I've dismantled it.

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tENTATIVELY, a cONVENIENCE is now currently (un)known as anonymous.

He is a Mad Scientist/d composer/Sound Thinker/ Thought Collector/As Been/ Psychopathfinder/Jack-Off-Of-All-Trades/Homonymphonemiac. He can be reached at 3809 Melwood Ave., Pittsburgh, PA 15213; phone (412)NUPTIAL.

TWO GENERATIONS OF EXPERIMENTAL MUSICAL INSTRUMENTS

By Tilman Küntzel and Margrit Küntzel-Hansen

Working in Lüneburg in the 1960s and 70s, the German music teacher and theorist Margrit Küntzel-Hansen developed a system of music pedagogy for children, with home-buildable musical instruments as a central feature. In the article following here, Ms. Küntzel-Hanson's son, the composer and sound artist Tilman Küntzel, traces the influence of his mother's teaching on his own development as an explorer in sound. Then he presents a selection of her simple instruments for preschoolers, along with his translation of her accompanying descriptions.

FROM COCONUT SHELL TO MULTIMEDIA SOUND DESIGN

by Tilman Küntzel

I was quite impressed when I heard in 1993 from the Dutch music critic René van Peer about the existence of the magazine *Experimental Musical Instruments*. Since my early childhood, experimental instruments have been among the everyday items in my surroundings. My father, who was professor of music pedagogy, brought serious music theory into the house, while my mother knew how to create a playful way with it. She combined matters of education with musical games, which she practiced first with my brother, my sister and me, and later even with our friends. So I learned the alphabet by the means of rhythmic dance steps, singing and stamping my feet at the same time, according to the order of letters of the alphabet. In afternoons of sound making we changed kitchen rubbish and other utensils into musical instruments, as we turned our own adventure stories into music.

Inspired by the contemporary forms of composition of the 70s, the process of developing graphic notations naturally suggested itself. Soon [my mother was working with] groups of pre-school children, encouraging them to interpret their own compositions using their own graphic sound-symbols.

Loaded with those sound activities, I later searched for my own creative identity in the contemporary arts. I graduated at the High school of Fine Arts in Hamburg 1983. Yet I very soon realized how deeply my musical education at home had made an impact on my way of expression. Already in my first year of studies I began to translate visual impulses into auditory forms. My first pure sound piece, "Study for Soundmaker" was made 1985 with self-built sound instruments and sounding toys, produced with a simple multitrack tape deck.[1] It remained my only composition produced in this way. In retrospect, I was increasingly attracted to conceptual forms and — in a reflection of contemporary art— to the medial possibilities of space- and sound-design. And so, now I see myself as a "media artist" with the concentration on "interactive, alleatoric sound design." Though you can understand my sound installations also as instruments, onlookers create their own sound pictures within their individual actions.[2]

DESCRIPTIONS OF HOME-BUILDABLE INSTRUMENTS FOR CHILDREN

By Margrit Küntzel-Hansen; translated by Tilman Küntzel

1. Fill a coconut shell or walnut shell with peas or rice and close the two halves with tape.

2. Turn a wooden screw in and out through an sheet of cardboard.

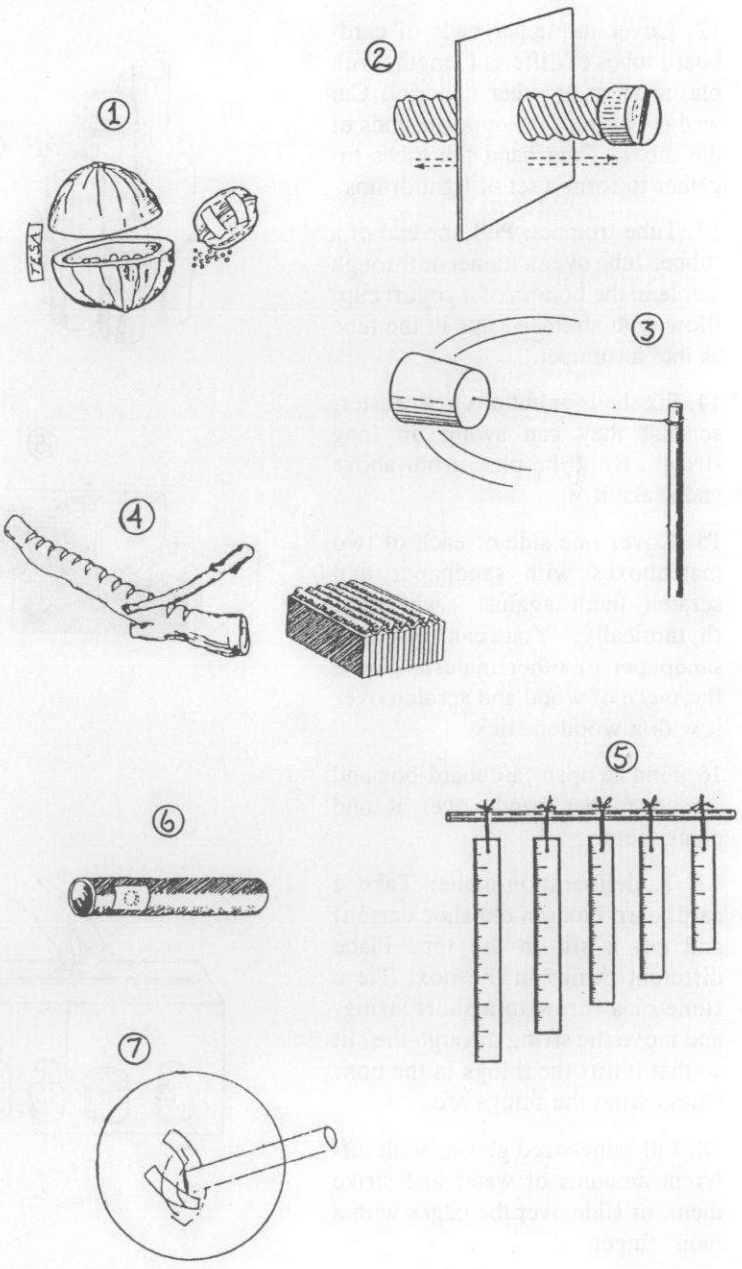
3. "Devil in the Forest": Bore a little hole in the bottom of a small plastic bucket and fix in a string in it with a knot. Spread rosin over the other end of the string and put it as a loop around a wood stick.

4. Cut notches in a piece of wood and scratch over it with another piece.

5. Buy rulers of different lengths and hang them in order of size on a staff.

6. Cover one opening of a cardboard tube with aluminum or vellum paper. Sing into the other end.
Variation: Cut a hole in the middle of the cardboard tube. Sing in there and cover the other holes with your hands.

7. Bore a hole in a ping-pong ball and stick in a straw (fix it with tape). Fill the ping-pong ball up to one third with water. Stick in a tiny hole in the side of the ball. Blow against the straw.



PHOTO, PREVIOUS PAGE: Children with instruments of their own making, following ideas of Margrit Küntzel-Hansen.

FOOTNOTES

1 On the CD "Wir fangen das Mögliche" ("We catch the possibility") Track nr. 27. See the review of this CD in EMI Vol 10 #4, June 95, by René van Peer.

2 When I traveled to California on a DAAD scholarship in 1993, I visited Richard Waters in Sebastopol. In his workshop I discovered the prototype of his worldwide-known "Waterphone" hanging under the ceiling: an old water boiler, out of which several pieces of wire were towering up. He told me that he probably would not have made this invention, if he hadn't grown up in his parents' hotel business, where the kitchen had been his favorite playground. His interest was focused on the metal and chrome pots. The sound modulation of water on the bottom of such pots and boilers must have fascinated him.

8. Drum sticks: insert a stick in a rubber ball or cork and fix it with glue.

9. Cut pieces of wire to different lengths and stick them in order in foam rubber or in styrofoam. Pass lightly over them with another piece of wire.

10. Hang nails of different lengths on a hanger and strike them with a metal stick or with another nail.

11. Hammer nails to different heights in a piece of wood and strike them with a metal stick or with another nail.

12. Cover the upper ends of cardboard tubes of different lengths with plastic wrap or other material. Cut wedges from of the opposite ends of the tubes. Then band the tubes together to form a set of light drums.

13. Tube-trumpet: Pull one end of a rubber-tube over a funnel or through a hole in the bottom of a yogurt cup. Blow with stretched lips in the tube as into a trumpet.

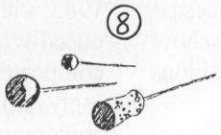
14. Fix shells or buttons to a coaster, so that they can swing on long strings. Hold the plate from above and shake it.

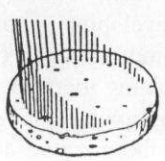
15. Cover one side of each of two matchboxes with sandpaper and scratch them against each other rhythmically. You can also fix sandpaper or other materials on a flat piece of wood and scratch over it with a wooden stick.

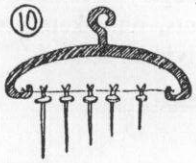
16. Find an open cardboard-box and stretch rubber bands over it and pluck them.

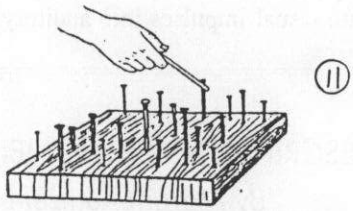
17. A deliberation-game: Take a cardboard box (an old shoe carton) and cut a slit in the top. Place different things in the box. Tie a stone or a screw to a short string, and move the string through the slit so that it hits the things in the box. Guess what the things are.

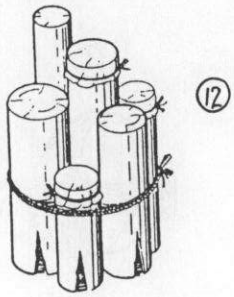
18. Fill same-sized glasses with different amounts of water and strike them, or slide over the edges with a moist finger.

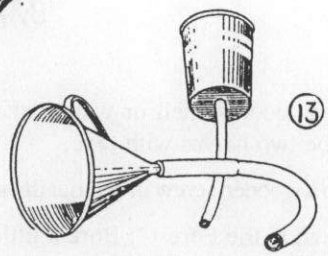


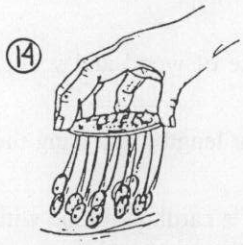


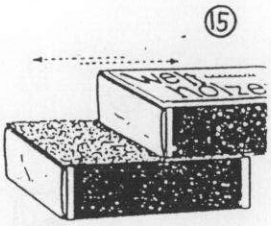


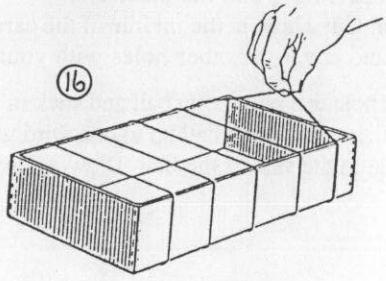


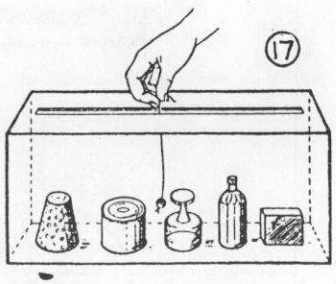


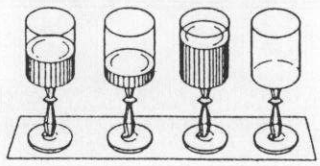


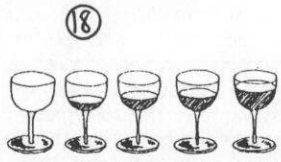










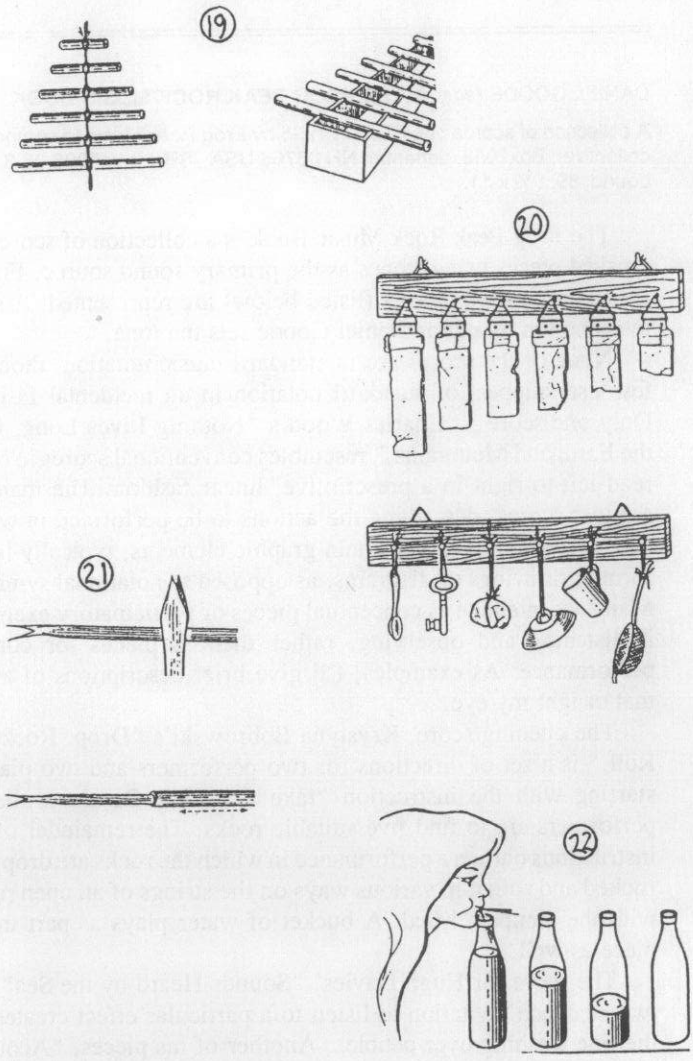


19. Saw an old broom-stick into pieces of graduated lengths. You can take the single pieces in your hand and knock on them, or hang them up in order of length. You can also do this with bamboo or copper tubes. Begin with a length of 5 cm and make each piece 2.5 cm longer until you reach the length of about 20cm.

20. Hang tile shards in order of size on a wooden support and strike them with a metal stick. You can also hang different things on the board and strike them with any other beater.

21. Flatten the upper end of a plastic straw and cut it to a point. The pointed tips must be free to vibrate in the mouth during blowing. If you shorten the straw, the tone gets higher. This mouthpiece is equivalent to the mouthpiece of an oboe. You can also push a second straw over the end of the first. If you move it, you will get different tones like a slide whistle. You can also make holes in the straw, like the holes in a flute.

22. Pour different amounts of water into some bottles. If you blow over the edge, different tones appear. Smaller air volumes will produce higher tones that bigger volumes. To create a scale, start with bottles of the same size, and add as much water as you need to each to reach the tone you want.



Margrit Küntzel-Hansen was born 1928 Hannover, Germany. Educated as a teacher. Founder in 1972 of the "school for music" in Lüneburg, Germany. Published more than 20 books on music education of pre-school children. Creator of the color-chimes and other pedagogic systems. Lectured at different schools. Since 1991 Honoraprofessor in Lüneburg where she lives.

Tilman Küntzel was born 1959 in Jugenheim, Germany. 1982-1991 studied Fine Arts in Hamburg. Since 1992 lectures on "Music in Social Work" at Technical High School department of Social Sciences. 1993 DAAD-Stipendium California (Allen Caprow) "Soundart in California." Since 1990 exhibitions and concerts in Poland and Germany. Subjects: sound objects, interactive sound installations and musical compositions. Lives in Stockholm, Sweden and Lüneburg, Germany. Tilman Küntzel can be reached at Sultenweg 55, D-21339 Lüneburg, Germany.

AVAILABLE MATERIAL FROM TILMAN KÜNTZEL

CD: *Wir fangen das Mögliche* ("We Catch the Possibility") 1992. This CD and booklet served as the catalog for an exhibition of Tilman's work in Baden-Baden. See René van Peer's review in *EMI* Vol. 10#4. Available from Kunsthalle Baden-Baden, Lichtentaler Allee 8a, D- 76530 Baden-Baden, Germany; Fax: +(0)7221 38590

Audiotape: *Perilous Enterprise* 1995. Digital recordings from 1992.

Catalog: *Das Auge sucht, das Ohr findet* ("The Eye Seeks, the Ear Finds")1991. 78 pages, texts, photos, scores. Available from Tilman Küntzel, Sultenweg 55, D-21339 Lüneburg, Germany. Fax: +11 (0)8 237231 (Sweden).

Catalog: *Based on a true Story* 1996. 37 pages. Art-memory game with 26 photos and sketches by Tilman Küntzel. Available from Verein zur Förderung innovativer Kulturaktivitäten, Frankfurt/O.e.V., Im Technologiepark 1, D-15236 Frankfurt/O.Germany; fax: + (0)335 557-1110

Catalog: *Time and Space, Sound and Silence, Presence and Void,* Paul Panhuysen & Tilman Küntzel 1995. 32 pages, texts by Panhuysen and Tilman Küntzel, color photos. Available from Galeria Arsenal, ul. Mickiewicza 2, pl.-15-222 Bialystok, Poland; Tel/Fax: + (0)85 420353.

AVAILABLE MATERIAL FROM MARGRIT KÜNTZEL-HANSEN

Klangwerkstatt 1 (Soundworkshop 1). Songs and games. 2nd edition. 1971. ISBN 3-7800-6072-2; order nr: 6072

Klangwerkstatt 2 (Soundworkshop 2). Soundscales and soundstories. 1979. Order nr: 6034

Klangwerkstatt 3 (Soundworkshop 3). Notes and play pieces. 1980. Order nr: 6037.

Musikspiele ("Music Games"), 3rd edition (for teachers). Order nr: 60 37. Available from Kallmeyersche Verlagsbuchhandlung, D-30927 Seelze-Velber, Germany Postbox 10 01 34.

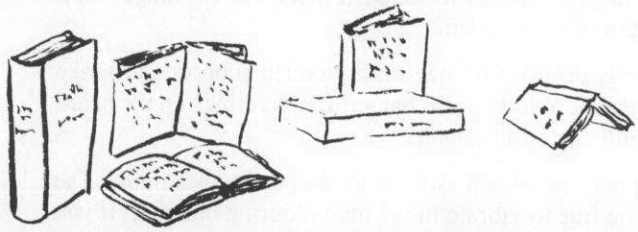
Musikalische Früherziehung als Erlebnispädagogik ("Musical Education for Preschool Children as Experience-Pedagogy"), 1990. 29 p. ISBN 3-88456-075-1. Available from Verlag Neubauer, Fährsteg 3, D-21337 Lüneburg, Germany.

Musik in Krippe und Kindergarten ("Music in Cribs and Kindergardens") 1994. ISBN 3-472-01548-9.

Musikwerkstatt Sozialpädagogik ("Musicworkshop Social-Pedagogy")1995 including three reports from Tilman Küntzel: "Building Soundsculptures", "Sound and Colors", and "Creative Works with Electronic Media") (in preparation). Available from Luchterhand Verlag, D-56513 Neuwied, Germany.

BOOK REVIEWS

By Bart Hopkin



CHESLEY GOSEYUN WILSON, RUTH LONGCOR HARNISCH WILSON, and BRYAN BURTON: **WHEN THE EARTH WAS LIKE NEW: WESTERN APACHE SONGS & STORIES**

Book with CD from World Music Press, PO Box 2565, Danbury CT 06813-2565. Large format paperback, 122 pages.

In the March 1995 issue of *Experimental Musical Instruments* (Volume 10 #3) we had an article from Chesley and Ruth Wilson and Brian Burton on the construction of *Tsii'edo'a'tl*, or Apache Violin, made from the stalk of the agave plant. Here now is a full-length book and CD from Burton and the Wilsons on many facets of Apache life and culture. Included are reminiscences of Apache life, descriptions of Apache ceremonies, transcriptions of ceremonial and social songs, traditional stories, and instructions for the construction of several musical instruments.

The figure of Chesley Goseyun Wilson stands at the center of this book. It is through his childhood memories that we learn of an Apache way of life from an earlier era; and it is through his experience and skills that we are guided through the instrument making procedures. The CD captures his voice in traditional Apache songs, and his playing of the instruments. In the background another figure emerges here and there — that of the Apache leader Geronimo. The Geronimo that comes through here is strong, humorous and warmly human. And he, too, was a maker of Apache musical instruments.

First among the instruments described is the Apache violin. The instrument has a single string, mounted with a small bridge and tuning peg on a hollowed cylindrical agave stalk about a foot long, and beautifully decorated. It's played with a bow of willow or sumac strung with horsehair or, more recently, another violin string. Full instructions on the making of the Apache violin appear in the book, starting with the process of locating and cutting a suitable agave stalk.

Following that are instructions for an Apache flute. It's a fipple flute made from a species of bamboo found along rivers in southern and eastern Arizona. It uses an arrangement, typical of many Native American flutes, in which the air blown into a first section of the tube, forming an antechamber, is blocked and forced through a covered external duct, and from there across the edge of an opening leading into the sounding portion of the tube. For both the violin and the flute there are recorded examples on the CD, and transcriptions on the selections in standard music notation in the book.

The drums described here are water drums made from pre-existing ceramic jars or metal pots. The heads typically are buckskin, but other materials have been used. A small amount of water goes inside before attaching the head, to modulate the tone. The drums aren't always made to be permanent, and the pot or jar that is the drum body may later revert to its original purpose.

When the Earth Was Like New is not designed as a scholarly or anthropological work, although the bibliography and discography do suggest further material for the serious student. It's an attractive, easy-to-read book, with plenty of fine photographs; serving as an introduction to and an appreciation of facets of Apache life and culture. For *EMI* readers, the descriptions of the Apache flute and violin will be especially valuable.

DANIEL GOODE (editor): **THE FROG PEAK ROCK MUSIC BOOK**

A collection of scores published in 1995 by Frog Peak Music (a composer's collective), Box1052, Lebanon, NH 03766 USA. ISBN 0-945996-06-3. Wire bound, 89, 8½ x 11.

The Frog Peak Rock Music Book is a collection of scores for musical pieces using stones as the primary sound source. Fifteen contemporary composers (listed below) are represented. A short introduction by editor Daniel Goode sets the tone.

None of the scores are in standard music notation, though a few use snippets of standard notation in an incidental fashion. Only one score — Charles Wood's "Nothing Lives Long, Only the Earth and Mountains," resembles conventional scores in being read left-to-right in a prescriptive, linear fashion. The majority are text scores, describing the actions to be performed in words and sentences. Several contain graphic elements, typically in the form of drawings or diagrams, as opposed to notational symbols. Many are intended as conceptual pieces or participatory exercises in listening and observing, rather than as pieces for concert performance. As examples, I'll give brief descriptions of a few that caught my eye.

The opening score, Krystyna Bobrowski's "Drop, Rock and Roll," is a set of directions for two performers and two pianos, starting with the instruction "take a walk." On the walk the performers are to find five suitable rocks. The remainder of the instructions outline a performance in which the rocks are dropped, rocked and rolled in various ways on the strings of an open piano with the dampers lifted. A bucket of water plays as part in the piece as well.

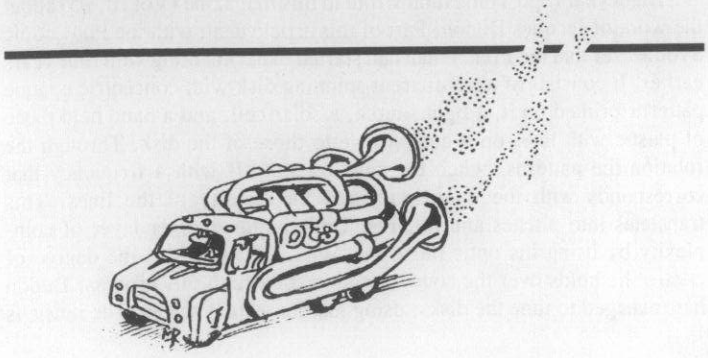
The score for Hugh Davies' "Sounds Heard by the Sea" is a two-sentence invitation to listen to a particular effect created by the tide washing over pebbles. Another of his pieces, "Acoustic Park," is an idea for a public sound park employing, among other things, pathways using different sorts of pebbles and stones for different sorts of footstep sounds.

The score for Daniel Goode's "Stone Structures" is a set of suggestions for a group of people in "any labyrinthine and resonant environment such as a maze of city streets, or a system of tendril-like canyons..." The people stand or walk in a snaking line. Each person has a pair of stones to click together, distributed among the people in the line in such a way as to create patterns of high- and low-pitched clicks. The piece is realized when the people click their rocks in sequence, so that the clicking patterns work their way down the line and back again. Different realizations of the piece might involve different patterns of pitch, volume and timing.

It's interesting to observe what a group of highly inventive composers comes up with given the relatively narrow palette of sounds you can get from commonplace stones left in their natural state. This is partly a question of imagination — how do you come up with an engaging composition using only limited materials? But it also brings to the fore a question of what one regards as fundamental: what's left, musically, when you strip away the elements of varied instrumentation, scale, harmony? In leafing through these scores, some themes emerge. One is number. Several of the pieces here employ recognizable number patterns as organizing elements, typically realized as patterns of beats or durations. Another is movement, or spatial organization: the performers don't simply produce sound; they are instructed to position themselves in particular ways or move in particular ways, allowing spatial and temporal patterns to arise in the series of sounds they make. More significant, to my mind, is the fact that most of these pieces abandon the parameters of concert hall performance, to create works oriented more toward a participatory experience in listening, observing, acting and being, often infused with a feeling of ritual.

In all this, does some sense of a quality of "stone-ness" emerge in the pages of this book? I'm inclined to say yes, and it takes shape something like this: Stones have a quality (subjectively speaking) of representing fundamental and irreducible elements of nature. Nothing could be simpler or more profound than stones. It is the business of composers to make constructs; to realize their idea of order by building edifices of sound. At the same time, there is a strong sense in the world today that we humans may have been constructing too much; the world is getting crowded with human constructions, and what was there before is getting crowded out. What these stones seem to have brought out from the composers is an effort not to litter the landscape with more composerly constructs, but rather to pay attention to what's already there; to hear the quietness of what has existed all along.

Composers represented in *The Frog Peak Rock Music Book*: Krystyna Bobrowski, Philip Corner, Hugh Davies, Jon Gibson, Malcolm Goldstein, Daniel Goode, William Hellerman, Eva Karczag and Annea Lockwood, Annson Kenney, Alison Knowlesand Joshua Selman, Skip LaPlante, David Mahler, Pauline Oliveros, Christian Wolff, Charles Wood.



RECORDINGS REVIEWS

By Warren Burt and René van Peer

BASTARD FINDERS: **SHING!**

Cassette from Barnzstuff Music, 4502 Springfield Ave., Philadelphia, PA. 19143, or at 554 Grove St., Newton, MA 02162

Bastard Finders is a musical project headed up by Philadelphia-based percussionist David Barnes. Three of the tracks on the album are rock-based; most of the others are atmospheric in one way or another. The title comes from a repeated sound used in the first track, "62 Shing." In this hard-rocking number, the sound of 62 pieces of metal being hit simultaneously (multi-tracked) is used as a counterpoint to the drumming, and the wailing of Buchla analog synthesizer and musettes, which sound to me like some kind of reed instrument. Also rock-based is the second track, "The David Byrne Peyote Ritual," with it's intentionally silly (I think) vocals over an interesting analog synth and percussion duet.

The third track is one of the delights of the album. "Anger Phase" begins with Barnes screaming out the title, then proceeding to bash the living daylights out of any metal objects within his reach. Mixed over this is an occasional drum roll. The discipline of the drum-rolls is the perfect foil for his totally undisciplined, enraged, chaotic bashing. It's a perfect way of dealing with anger. Vent it in a harmless way, and then present the results so that we can all laugh with it.

After the joyous insensitivity of "Anger Phase," comes the very sensitive and atmospheric "Prelude to a Thunderstorm," with Barnes on piano and delays, and Charles Cohen providing some extremely moving synthesizer playing. Mostly a drone piece, interest here is not so much rhythmic or melodic as it is timbral, with long sculpted clouds of harmonics drifting around and about each other. Also in the same category of beautiful soundscapes are "A Ship Abandoned," and "Spoons," from the second side. "Ship" was presumably inspired by the low, intense "fog-horn" sound Barnes' toilet produced. All manner of bell and water-like sounds are mixed together over the bass of this wonderful sustained low roar. "Spoons," played by Barnes and Steve Coxe, is a mix of acoustic guitar loops, Indonesian gender, synthesizer, circular saw blades, and two environmental tapes: a gift shop in Philadelphia, and an unidentified Egyptian singer. The gift shop tape becomes the environment in which all the other sounds take place. The results are haunting.

In contrast, "Gender Experiment" is full of rhythmic life. Barnes here plays a very lively and precise rhythm on three balafons and bass drum. This forms a bed into which Charles Cohen, Glenden Jones, and Kevin Murphy lay bending, shrieking glides from synthesizer, violin and trumpet. "Bastard Finders" is a lively and attractive collection of contrasting pieces. I look forward to hearing more from David Barnes and his cohorts.

—WB

PIERRE BASTIEN & MECANIUM: **MUSIQUES MACHINALES**

PIERRE BASTIEN: **EGGS AIR SISTER STEEL**

Both on CD from Pierre Bastien, Oudedijk 188c, 3061 AS Rotterdam, the Netherlands

The French trumpeter Pierre Bastien does not invent or build instruments, he devises ways to play existing instruments automatically. To this end he uses the construction game Meccano, that has always provided a wide array of possibilities for kids to make their own transmission systems; wheels, pulleys, chains, axles, cog wheels — anything you can think of. These are on one end connected to picks, sticks and bows that play the instruments (strings and percussion, mostly) in steady rhythms. On the other end they converge at (or rather, are controlled through) a mechanic system of switches. In this way Bastien can determine in what combinations these automatic instruments play. He can set the pace, he can get them to play in time. In fact these are compositions that he can use as accompaniment to his own trumpet. He can also have them make music of their own accord.

The instruments he uses come from non-Western traditions predominantly. Many are African, he has also several from Asia; one installation of his is in fact an automatic string quartet that sounds pretty convincingly like a Transylvanian Gypsy ensemble. His collection looks amazing. What's more, it sounds very charming. In part this due to the very outspoken timbres — some are hoarse, others immerse themselves in lush overtones as if they were bathing in sonic perfume. In part this is due to the transmission system being not very exact. Rhythms are only approximate. There is always an enjoyable margin of error. In sound and rhythm alike Bastien deviates from the aesthetic ideals of Western musical culture.

Bastien has conceived *Musiques machinales* around his contraptions. They provide a repetitive groundwork over which he blows his leisurely jazzy lines, sometimes aided by other musicians. Some tracks have the machines play a discreet music without human contributions. *Eggs Air Sister Steel* is what the title says — exercices de style, or stylistic exercises. In thirteen pieces a musical theme is played in as many different ways, reflected in the titles which are sonic equivalents and anagrams of this French expression. Here the machines are called upon where Bastien felt he needed them, just as he invited musicians to make their appearances. To my view the appeal of Bastien's music comes largely from the way that his instruments are the bottom line. They determine the soft overall tone. Their link in the chain is one of dogged resolution to be inaccurate and non-virtuosic. These are machines that a human can relate to.

— RvP

JACQUES DUDON: **LUMIERES AUDIBLES**

On CD from Atelier d'exploration harmonique, Les Camails, 83340 Le Thoronet, France

Eight years ago Tom Nunn wrote in this magazine (Vol III, #5) about the work of Jacques Dudon. Part of this article dealt with the Photosonic Synthesizer that the Frenchman had started experimenting with four years earlier. It consists of a transparent spinning disk with concentric opaque patterns printed on it, a light source, a solar cell, and a hand held piece of plastic with lines on it comparable to those of the disk. Through the rotation the patterns switch the cells on and off with a frequency that corresponds with the momentum and the density of the lines. This translates into pitches and timbres. Dudon adds another layer of complexity by using his optic plectrum. What is amazing is the degree of control he holds over the sounds produced through this process. Dudon has managed to tune the disks, using just intonation scales. The music is

loosely constructed, flowing from one combination of melodies and timbres to the next. The timbres he generates are strongly reminiscent of synthesizers as they are used in relaxation music — soft tones with no abrupt start or end, but with a reassuring sustain, with gently cascading, undulating and throbbing notes. And yet, as Dudon states repeatedly, none of the sounds were generated electronically.

With his exquisite looking disks (a couple of the 500 are portrayed in the booklet) Jacques Dudon creates a delicate, spacy music that is especially remarkable because of the way it is made.

— RvP

DUNCAN KING-SMITH: **SPIRIT EARTH: SOUNDSCAPES FROM EAST GIPPSLAND**

CD from Outdoors Information Centre; Department of Conservation and Natural Resources, State of Victoria; 240 Victoria Parade; East Melbourne, Vic. 3002; Australia.

East Gippsland is the far southeastern corner of Australia. Cut off from the development of the Sydney-Canberra-Melbourne corridor by a range of mountains, it has remained largely untouched up to the present, but its spectacular rainforests are now heavily threatened by an aggressive forestry industry. Composer Duncan King-Smith, with backing from the Victorian State Department of Conservation, made these gorgeous recordings of environments from around East Gippsland as part of an effort to raise public awareness of the amazing qualities of this threatened environment. The CD has 6 tracks, each of which cross-fades between 3 and 6 different environments, assembling sequences of sounds which, while they might not occur naturally, are both satisfying and fascinating.

The CD also features some of the best recordings of eastern Australian bird life I know of. Track 4, for example, begins with a wonderfully dense chorus of Australian magpies, the bird whose multiphonic call has had more than one synthesizer designer wringing their hands in frustration and amazement. Later in the track, Duncan gives us a rare duet between whipbirds, whose rapid upward glissandi are startling. While this duet is going on, there is a dense bellbird chorus in the distance, making an exquisite statistical chorus of tinkling sounds. Track 5 starts with a wonderful recording of a dawn chorus of kookaburras, while the thunderstorm with frogs that starts track 2 is awe-inspiring. I'm still wondering how he managed to get such clear and close-up recordings of those moaning, lowing frogs. For those of you who can't afford the plane fare to either Melbourne or Sydney, and the bus fare to the more remote parts of East Gippsland, this CD is about the best introduction you can have to the spectacular and threatened sound environments of southeastern Australia.

—WB

HARRY PARTCH: **17 LYRICS OF LI PO**, performed by Ted Mook, tenor violin, and Stephen Kalm, intoning voice. CD from Tzadik, 61 East Eighth St, Suite 126, New York, NY 10003

A number of new recordings and performances of Harry Partch's work have happened lately, accompanied by quite a bit of controversy as to what a "proper" Partchian performance tradition is. My own recording of Partch's "Bitter Music," (released as part of a 4 CD set on Innova) has come in for quite a bit of criticism, and this beautiful recording of the Partch Li Po songs, by Ted Mook and Stephen Kalm, has proven equally controversial. Partch, like Ives, is a difficult composer for performers to deal with. Both very much wanted to be part of the "cultivated" tradition of classical performance, but both had solid roots in, and sympathies with, the "vernacular" tradition of popular culture. Both traditions, however, have very different ideals of "proper" performance, and any performers approaching these composers have to decide which performance tradition they are going to follow.

In this recording, Mook and Kalm come down in favor of a cultivated tradition reading of Partch. This is especially clear in the light of Partch's own recordings of ten of the Li Po songs (re-released on the same Innova set), which are much more heavily oriented towards the vernacular. Mook and Kalm's recording is the first recording of the complete cycle of 17 songs. The vocal style is one of speaking on pitches, with occasional bursts into song. Partch is a very demanding composer for the voice, demanding everything from basso profundo to highest falsetto yelling, often within a few seconds of each other. His primary concern as a composer was with the intelligibility of the text. In both these aspects, despite an occasional slight use of a singers' vibrato, Stephen Kalm succeeds admirably. The texts are always highly intelligible, and are performed with a real musical sensitivity. Likewise, Ted Mook's tenor violin playing. It sounds accurate, serious, loving and sensitive, and the two performers blend marvelously, projecting a very rarefied and elegant conception of these early 1930s art songs.

This is clearly an important recording, where Partch's microtonal pitches, words, and the austerity of the original poems live. What you won't get from this recording, though, is a sense of Harry the wisecracking, irreverent, quoting, vernacular-loving post-Modernist. For that, you'll have to refer to Partch's own versions of the songs. Both versions are to my ears, equally valid, and each has its own attractions. But what the contrast between these two versions shows most clearly to me is that one essential difference between the two traditions, a difference that might almost be considered political, is their approach to resonance. Partch's original instrument, the adapted viola, was a viola body with a cello neck glued on, with its lowest string being a G below the viola's lowest C. This gave the instrument a resonance which was somewhat nasal — emphasizing the higher harmonics. Similarly, Partch and William Wendlandt, in their original recordings, use a vocal tone that is more oriented towards head and nasal production, and not from the chest. Mook, on the other hand, uses the tenor violin, one of the instruments developed by Carleen Hutchins of the Catgut Acoustical Society, which allows a sense of violin resonance to exist in instruments of lower pitch range. The sound of the tenor violin is much richer than the adapted viola, with more emphasis on the resonances around the pitch fundamentals. Likewise, Stephen Kalm's baritone voice is very much from the chest, and richly resonant. Partch and Wendlandt, being more oriented towards the vernacular, emphasize the higher resonances. Mook and Kalm, being part of the cultivated tradition, emphasize lower resonances.

Both styles of performance work equally well for me in 16 of the 17 songs. The one performance I would question is Mook and Kalm's version of "I am a Peach Tree," the last of the cycle. Partch's version, which takes 1:25, is irreverent, with the adapted viola clearly referring to the ukulele pop music of the day. Mook and Kalm's 2:17 version is much slower, and elegiac, making a gentle conclusion to their large-scale conception of the song-cycle. Earlier in this review I mentioned Ives. At this point Shostakovich springs to mind, who in "Testimony" complained that many performers did not understand that the conclusion of his 5th Symphony was meant to be irreverent. I can understand Mook and Kalm's reasons for performing this last song in this way, but I somehow feel that even though valid, the cycle would have more punch if it ended with a spirit similar to the nose-thumbing of Harry's original. Despite my reservation on this point though, I think this is an essential recording of a major mid-20th century classic. And to those wishing to hear two culturally very different conceptions of the same music, my advice would be to buy both Kalm and Mook's, and Partch's versions.

—WB

EXPERIMENTAL MUSICAL INSTRUMENTS

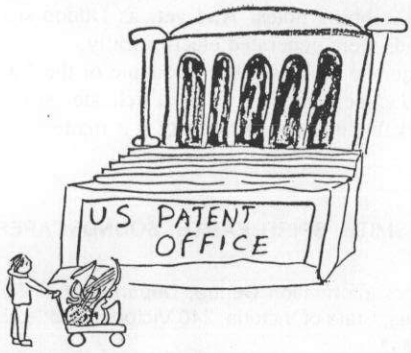
Typeface designed by Monty Thrasher

Historical Musical Instrument Patents

THE PLASTIC UKULELE AND GUITAR

Inventor: Mario Maccaferri

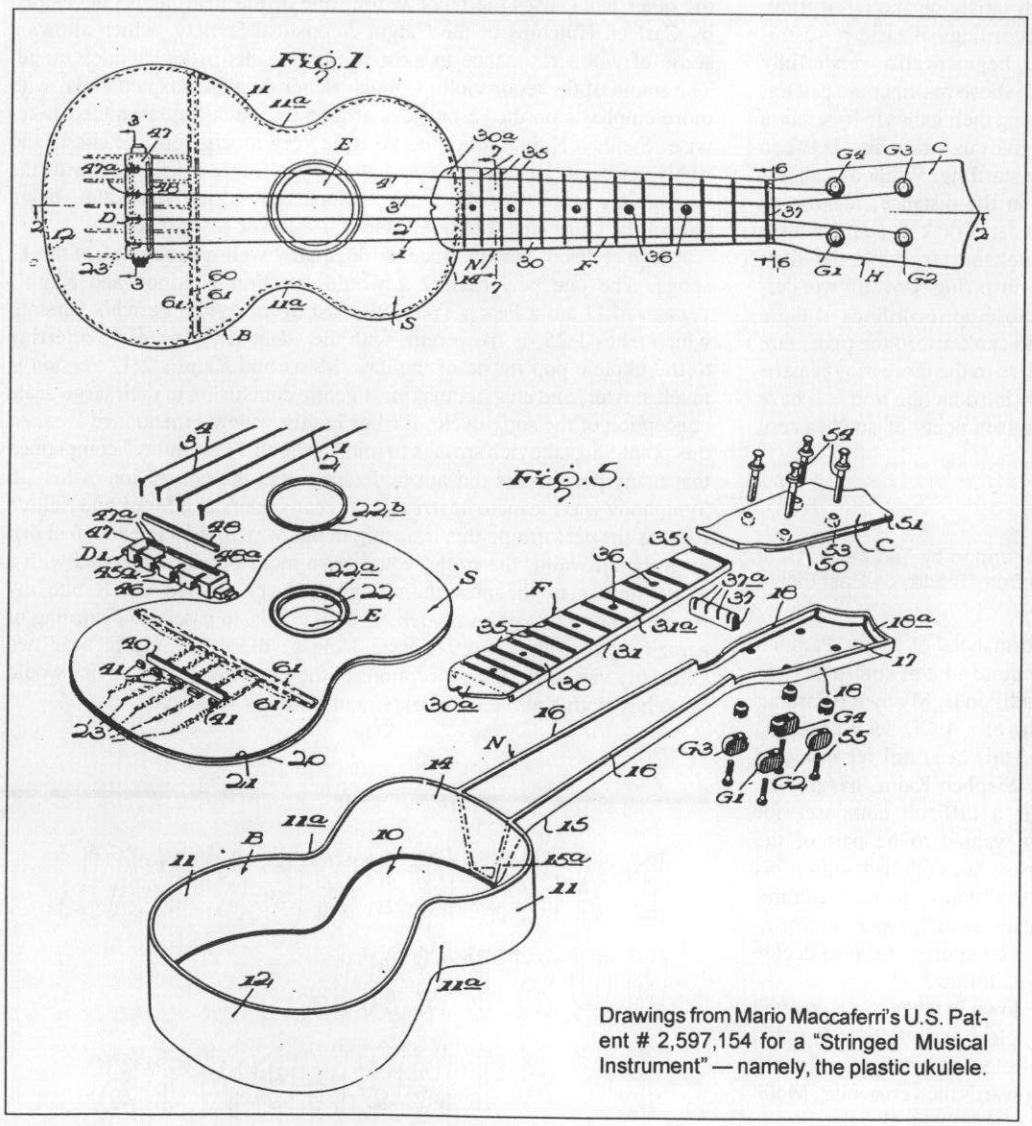
By Cary Clements



In the last installment of this series I talked about how the need to have a patent for an invention that stood the chance of becoming an economic success is especially important. The plastic ukulele, invented by Mario Maccaferri, is a good illustration of this point — an inventor discovers a void in the marketplace, invents a solution for it, then sells quite a few of them.

In the late 1940s one of the most popular entertainers on television was Arthur Godfrey. His show, which featured Mr. Godfrey prominently playing the ukulele, reached an audience of some 35 million. During a chance meeting with Mr. Maccaferri in 1949 at a Miami hotel, Mr. Godfrey lamented that if someone could produce an easily playable uke that sounded good, and could sell it for less than ten dollars each, that he could sell a million of them.

And indeed, more than nine million of these plastic ukes, designed and manufactured by Mario Maccaferri, were sold between 1949 and 1958. They sold under a variety names including "Islander" and "TV Pal," and cost $4.95 when first introduced.



Drawings from Mario Maccaferri's U.S. Patent # 2,597,154 for a "Stringed Musical Instrument" — namely, the plastic ukulele.

This from U.S. Patent No. 2,597,154 filed on March 15,1950 by Mario Maccaferri and issued on May 20, 1952:

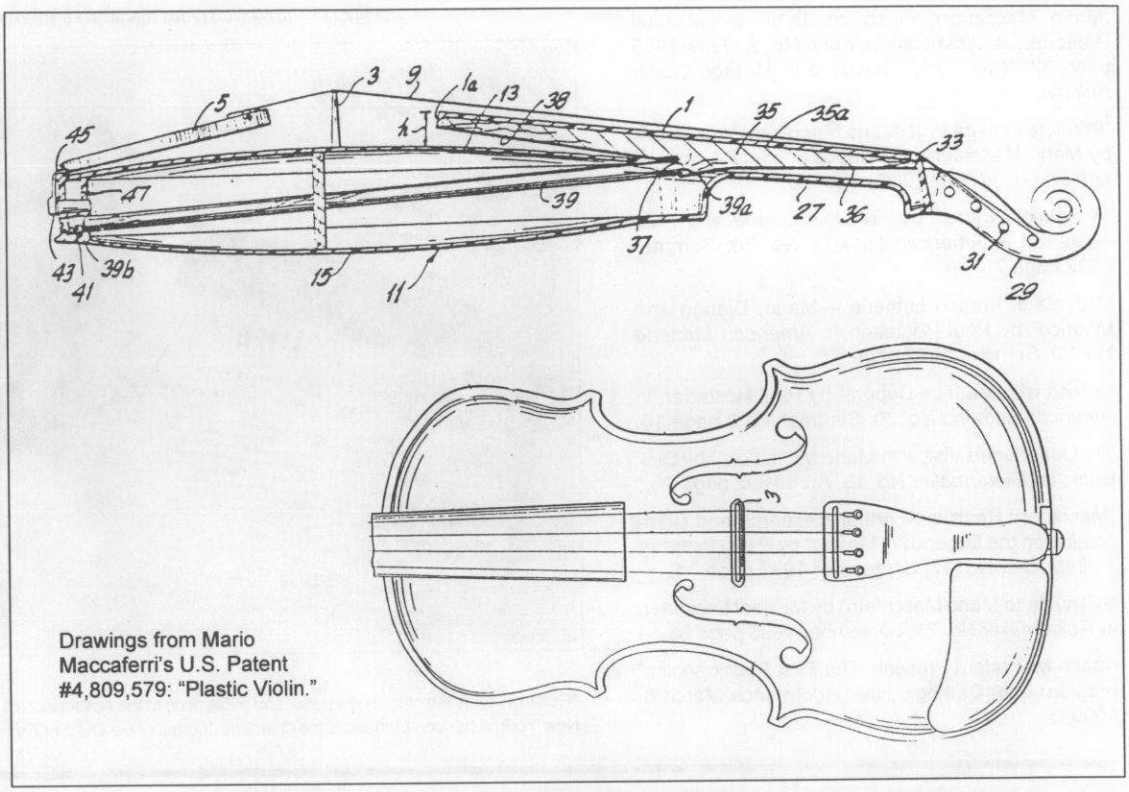
> The primary object of my present invention is to provide a stringed musical instrument of such types which is formed entirely of a suitable plastic or plastics having requisite properties and characteristics to form a body or bell, including the sounding board, which will have and retain in use the necessary resonant quality as well as a desired volume and fidelity of tone to compare favorably with the best of the wood instruments."

This "toy" instrument was protected by at least five different U.S. patents. Patent No. 2,597,154 covered the basic instrument itself. Patent No. 2,664,022 covered the details of the string nut. No. 2,649,827 is concerned with the plastic sound board. No. 2,614,448 details the construction of the bridge for the plastic uke. And Patent No. 2,649,828 — which goes into excruciating detail about the process of making a fretted finger board out of

"molded thermoplastic materials," including how to make the frets themselves a different color than the rest of the fingerboard.

The "chord player," a clever device that attached to the neck of the uke with rubber bands and allowed the player to "finger" different chords by pressing a single button, has its own patent, No. 2,669,151.

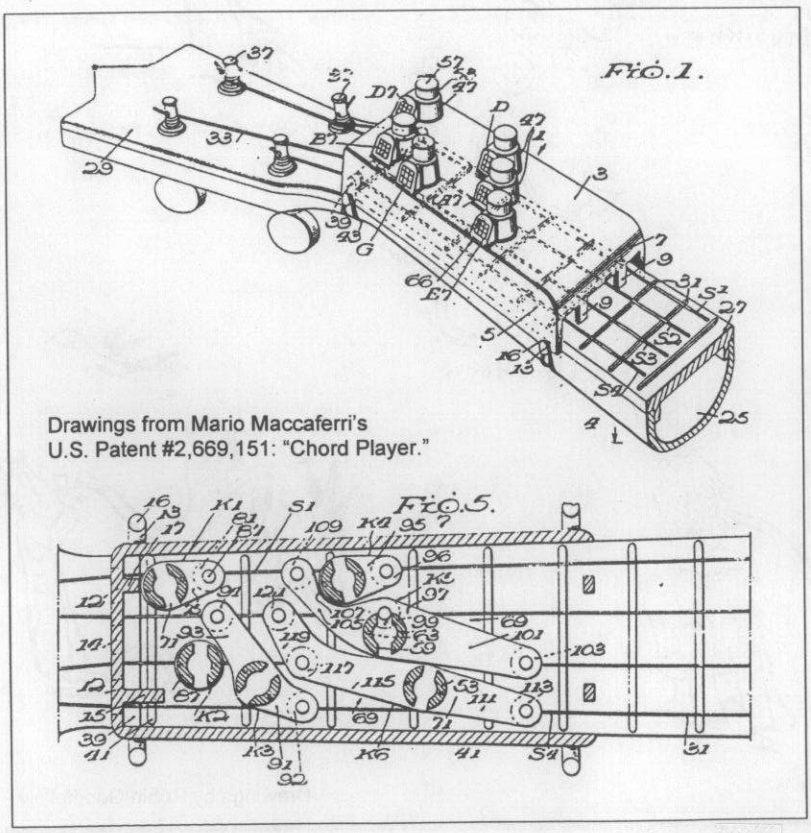
Mario Maccaferri devoted most of his life to the playing and building of musical instruments. He was apprenticed at an early age to a renowned luthier in his native Italy and by the age of nineteen was performing throughout Europe on the guitar. In the 1920s and 30s he was considered to be such a good player that his name was often mentioned in the same breath with that of Andres Segovia.



Drawings from Mario Maccaferri's U.S. Patent #4,809,579: "Plastic Violin."

It was during this period that he designed the Selmer guitar that was later made famous by Django Reinhart. When he broke his hand in 1933, Mario decided to concentrate less on performing, and purchased the machinery to manufacture saxophone and clarinet reeds. As war in Europe neared, he relocated to the United States where, due to the unavailability of imported cane he became the sole maker of plastic reeds. He invented many things in plastic, including the brightly colored plastic clothes pins that are still available in supermarkets today.

He also designed plastic guitars. His company, Mastro Industries, manufactured many different models and at one point were selling more than 15,000 a day. U.S. Patent No. 2,793,556, issued to Mr. Maccaferri in 1957, details the bolt-on neck joint and the tuning machines that were built into the headstalk of one of these plastic instruments.



Drawings from Mario Maccaferri's U.S. Patent #2,669,151: "Chord Player."

The following quote from "Professor" Maccaferri was printed on the tag that hung from many of these guitars when sold: "All my life I have been associated with guitar playing and manufacture. My long experience, plus modern engineering techniques and materials, have made this instrument possible today. The Maccaferri Guitar has been thoroughly tested by many top-ranking guitar players, who agree unanimously, that no finer guitar has ever been produced. The Maccaferri Guitar compares favorably with instruments costing hundreds of dollars more!"

When Mario Maccaferri died in April 1993 at the age of 93, he was still active in the making of musical instruments. He is greatly admired today by the guitar-making community in the U.S. for his contributions to the lutherie craft. In his later years he worked on developing a plastic violin and was issued Patent No. 4,809,579 in 1989. In March 1990 a concert was performed on one of these plastic violins at Carnegie Hall in New York City.

BIBLIOGRAPHY

"Mario Maccaferri: Fiesty as Ever" by Michael Dresdner, in *American Lutherie* No. 2, June 1985 page 32. (Previously published in *Vintage Guitar Bulletin*.)

"Primiata Liuteria Prof. Mario Maccaferri" from a talk by Mario Maccaferri at Symposiu '85, in *American Lutherie* No. 7, Fall 1986 page 29.*

"A Selmer Primer" by Francois Charle and Paul Hostetter, in *American Lutherie* No. 30, Summer 1992 page 7.

"Travels in French Lutherie —Mario, Django and Maurice" by Paul Hostetter, in *American Lutherie* No. 30, Summer 1992 page 6.

"A Visit with Maurice Dupont" by Paul Hostetter, in *American Lutherie* No. 30, Summer 1992 page 10.

"An Unabridged Visit with Mario Maccaferri" by Dick Boak, in *Guitarmaker* No. 15, April 1992 page 26.*

"Maccaferri Revisited-Further Research and Clarification on the Legendary Master" by Paul Hostetter *Guitarmaker* No. 17, September 1992 page 15.

"A Tribute to Mario Maccaferri" by Michael Dresdner, in *Guitarmaker* No. 21, September 1993 page 38.

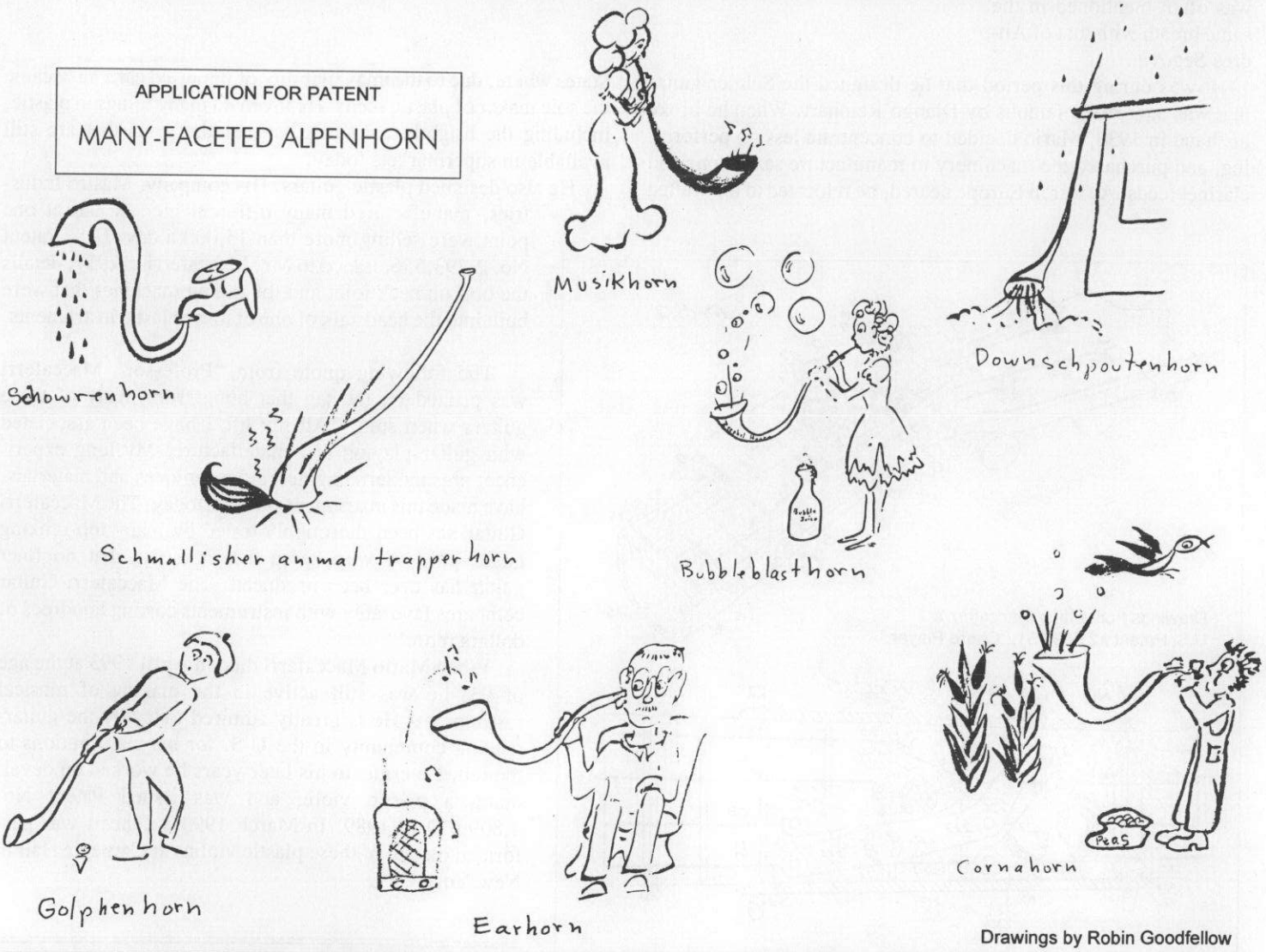
"Mario Maccaferri Presents The First Plastic Violin," program from Carnegie Hall performance March 8, 1990.

1955 advertisement for the Mario Maccaferri's plastic ukulele
(as reprinted in *The Music Trades* magazine's special centennial Issue, 1990.)

*Guitarmaker is the official newsletter and publication of the Association of Stringed Instrument Artisans, Paul Smiths, New York. *American Lutherie* is the Quarterly Journal of the Guild of American Luthiers, Tacoma, Washington.

APPLICATION FOR PATENT

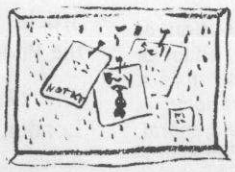
MANY-FACETED ALPENHORN



Drawings by Robin Goodfellow

NOTICES

KENTUCKY KALIMBA FOR TWO — unique design, pentatonic scales on both sides for two players simultaneously! Hand-crafted walnut, 8 spring-steel keys, tuning marks for easy alignment. $50, $60 with gourd resonator. From Gregory Acker, 518 E. Kentucky St., Louisville, KY 40203 (502) 585-5134. [12-1]



THE WORMHOLE ... One of a kind, diamond in the rough? store in WPB, FL, seeks unusual musical instruments for consignment purposes. Please write ... or call ... Steve Rullman c/o Wormhole, 115 So. Olive Ave., WPB, FL 33401; phone (407) 659-3082. [12-1]

Sing, My Khomus: Jew's Harp of the Sakha (Yakut) People, Eastern Siberia has newly been released on CD by Nihon Koukin Kyoukai (Japan Jew's Harp Association). The texts are in Japanese, Russian and English. The cost for purchase outside of Japan is US $30 including shipping. Payable only with international postal money order; bank checks not acceptable. Send to Leo Tadagawa, Nihon Koukin Kyoukai, 1-12-24 Midorigaoka, Ageo, Saitama 362, Japan; e-mail fm9r-tdgw@j.asahi-net.or.jp. [12-1]

UK company Longwave Instruments are looking for a distribution outlet in the US for high quality hand-built theremins, and the MCV1a Theremin MIDI/CV interface. E-mail 101364.522@compuserve.com; tel: +44 1747 820 536, ask for Adam. [12-1]

The SPIRITFLUTE (patent pending) is a new motion-activated instrument. It is not blown, but held at one end and swung gently through the air. A flute-like tone immediately sounds, making melodic leaps in response to subtle variations in motion. Rhythmic movement creates rhythmic phrases. Rapid arpeggiations and trills are as easily played as sustained tones. Fingering the tonehole causes the SpiritFlute to alternate between two sets of harmonic overtones which are established in a predetermined musical mode. As such, it cannot play "wrong" notes.The SpiritFlute is available in the key of A*b* in three different modes — Major, 'Blues', and Mid-Eastern — for $42 ppd. each. Playing range is A*b*4 to A*b*6 (2:1 - 8:1). Please send enquiries and orders (specify mode) to: Michael Meadows, 2226 W. Barker, West Peoria, IL 61604. [12-1]

Saga Haruhiko in Japan has twelve Mongolian Horse Head fiddles to sell. This instrument is 30 to 40 inches tall and is a variation on the theme of the Erhu. It has two strings, no frets or fret board, and a skin-covered resonator. It's played with a horse hair bow. The instrument is also known as an *Igil*, or a *Morin Khuur*. It is the instrument used by the Tuvan throat singers in their traditional music. Anyone who might be interested can contact Saga Haruhiko directly by e-mail at saga@phys.hokudai.ac.jp.. He's asking US$377 for each instrument, which includes postage from Japan to the US. [12-1]

Examples of historical, ethnic and contemporary musical instruments utilizing gourds at some place in the instrument are being solicited for a book on *Gourd Musical Instruments*. The authors have just published *The Complete Book of Gourd Craft*, Lark Books, 1966, and are expanding the music chapter into an entire volume. Please send snapshots to Jim Widess c/o The Caning Shop, 926 Gilman St., Berkeley CA 94710. The authors will contact you later for either professional slides or for shipment of the instrument to them for photography. An audio CD or cassette is to be published with the book. [12-1]

Call for quality slides of bamboo musical instruments and sound devices, for use in a talk I will give at the American Bamboo Society national convention in Oct. 1996 on bamboo arts and crafts. I will be happy to pay for duplicates of slides if they are high quality. Richard Waters, PO Box 1071, Pahoa, HI 96778; e-mail bamboomuse@aol.com. [12-1]

By Geary Thompson:
The Quartal System (introduction, using comparison graphics): $5.00 pp
The Quartal Concept (explanation of evolution and conception): $5.00 pp
The Quartal Guitar (chord and scale fingering reference): $10.00 pp
The Quartal Board (chord and scale fingering reference): $10.00 pp
Quartal, 6462 50th ST., San Diego CA 92120. [12-1]

5th Annual North American Jew's Harp Festival (unusual instruments welcome). Saturday, Aug 17, 1996, Eagle Valley Grange Park, Richland, Oregon (Interstate 84, Exit 302 ... 39 miles east of Baker City). Workshops, performances, children's events. Musician's retreat August 16, 17, 18. For information: PO Box 92, Sumpter, OR 97877; phone (541) 894-2345. [12-1]

EXPERIMENTAL AND ELECTROACOUSTIC RECORDINGS FOR SALE. Many unusual titles, such as Harry Bertoia, etc. LPs a specialty. Send for free listing to: SONIC TIGER MUSIC, PO Box 715, Cambridge, MA 02140 USA. [11-4]

New Instruction Video: You too can play the Musical Saw. Everything you need to know. $29.95. From Charlie Blacklock, 1821 St. Charles St., Alameda, CA 94501. [11-3]

The Pauline Oliveros Foundation enters its second decade with a new 3-year certificate program in Deep Listening, a new catalog, a new Deep Listening recording label, and deep listening expeditions. For a catalog or information contact the Pauline Oliveros Foundation at PO Box 1956, Kingston NY 12401-0900, email Oliverosfd@aol.com; World Wide Web site at http://www.tmn.com/oh/artswire/www/pof/pof.html. [11-3]

DIDGERIDOOS — Buy direct from Australia and save. I have been asked by several Aboriginal friends of mine to help them sell their products. Each didgeridoo is about 5 ft long and a high quality instrument with traditional aboriginal designs burnt and/or painted on them. You can now purchase them direct from Australia and save. By cutting out the exorbitant fees charged by importers, distributors and middlemen, these authentic didgeridoos are now available for Australian$199 (US$155 approx), plus freight. Payment is easy by major credit cards or money order. Trade enquiries welcome. Send enquiries and orders to: Graeme Eastman, Mainz Pty Ltd., 209 Shaftesbury Ave., Bedford, W.A. 6052, Australia; Ph: +(619) 275 6246; Fax: +(619) 275 3874 [11-4]

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BROADCASTATIC WVCW 640 AM / 105.3 Continental Cable FM: Experimental music radio show. Music & Noise; Fun with Tape Recorders, Record Players, annoying sounds. Please send tapes & mail to: TOMMY / PO Box 7222 / Richmond, VA 23221. [11-1]

WAYLAND HARMAN'S CLACKAMORE — "THE WORLD'S NEWEST PERCUSSIVE MELODY INSTRUMENT." Clackamore $23.00 ppd, PVC case $6.00 ppd, instructional video $20 ppd. PO Box 6444, Boise ID 83707. The Clackamore — a tool for listening to the shape of your mouth. [11-2]

Thoreau's Aeolian Harp music as he heard it at Walden Pond. Tape cassettes of the music from this harp accompanied by songs of the wood and hermit thrushes. Harp reproductions of his own design available in Walnut. Ken Turkington 1-800-692-HARP. [11-2]

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Now available! **Musical Instrument Design: Information for Instrument Making**, a new book by Bart Hopkin, editor of *Experimental Musical Instruments*, published by See Sharp Press. The price of $18.95 includes shipping within the U.S. (for overseas air add 20%). *Musical Instrument Design* presents underlying principles for the design and construction of acoustic musical instruments of all sorts, with a practical, hands-on approach. There is no other book like it; no other book gathers this information under one cover. Just under 200 pages long; large format; fully illustrated. Order from *Experimental Musical Instruments*, PO Box 784, Nicasio, CA 94946, USA, phone (415) 662-2182. [11-4]

The EMI Wall Chart is a beautiful 24" x 36" wall poster, with graphic design by Gwendolyn Jones, covered with practical reference information relating to musical instruments and instrument making. Suitable for workshop, living room or art gallery. The price is $12 (shipping free within the U.S.; for overseas air add 20%); order through *Experimental Musical Instruments*. [11-4]

Making Simple Musical Instruments: A Melodious Collection of Strings, Winds, Drums & More — A book by Bart Hopkin, editor of *Experimental Musical Instruments*, published by Lark Books. It is a collection of plans for home-buildable musical instrument, ranging in difficulty from simple to moderate. The book is written for a general, non-specialist audience, and the approach is non-technical. The instruments aren't so very far out: most of them relate to familiar instrument types and are playable as such. Yet even experienced experimenters will find some new ideas here. It's hardbound, with 144 big and very full pages, lots of color, beautiful photos & illustrations; price $24.95. Order from Experimental Musical Instruments, PO Box 784, Nicasio, CA 94946, USA, phone (415) 662-2182. [10-4]

Air Columns and Toneholes: Principles of Wind Instrument Design is a spiral-bound booklet containing the four articles on practical wind instrument acoustics by Bart Hopkin that appeared in EMI in 1992 and 1993. The articles have been much revised and improved, and there are several additional features included. Published by Tai Hei Shakuhachi; available for $14.00 (no additional postage required) from EMI, Box 784, Nicasio, CA 94946. [9-4]

A REMINDER — Unclassified ads here in *EMI*'s notices column are free to subscribers for up to 40 words; 40¢ per word thereafter. For others they are 40¢ per word, 15 word minimum, with a 20% discount on orders of four or more insertions of the same ad.

DISPLAY ADS IN EMI are more affordable than you might think. $60/half page, $40/quarter page, $25/eighth page. If you have a product or service that you'd like to promote just a bit more conspicuously, call or write for details: EMI PO Box 784, Nicasio, CA 94946; phone/fax 415/662-2182.

SUBSCRIPTIONS TO EMI: $24/yr for U.S.; $27/yr for Canada & Mexico; $34/yr overseas. Order from EMI, Box 784, Nicasio, CA 94946, USA. Visa/MC accepted.

EMI BACK ISSUES: Bound volume sets Vol 1 through Vol. 10: $17 per volume. Each volume set contains all of the issues of one volume year, photocopied and bound under one cover. The photocopies are a step down in quality from the original press runs, but they are fully readable still. The price includes postage for U.S., Canada & Mexico air, and overseas surface rate. For overseas air add 20%. In California add 7.25% sales tax. Visa and MasterCard accepted. Order from EMI, PO Box 784, Nicasio, CA 94946, or write for a listing of back issues and their contents. Corresponding cassette tapes are available for later volumes; see information below.

CASSETTE TAPES FROM EMI: Each cassette in the EMI cassette series contains music of instruments that appeared in the newsletter during the corresponding volume year, comprising a full measure of odd, provocative, funny and beautiful music. Volumes VI, VIII and 9 and 10 are available (Volumes I - V and VII are now sold out). The price is $8 per cassette. This includes postage for air delivery in the U.S., Canada and Mexico, or surface delivery overseas. In California add 7.25% sales tax. For overseas air add $20%. Order from EMI, Box 784, Nicasio, CA 94946. Visa and Mastercard accepted.

RECENT ARTICLES, continued from back cover

Deep Listenings (Viale Allesandro Magno 264, 00124 Rome, Italy) has been running Italian translations of Reed Ghazala's *EMI* articles, including The Odor Box in their issues #3 and 4, and the Photon Clarinet in #5.

The Galpin Society Journal XLIX 1996 (7 Perceval Ave., London NW3 4PY England) contains the following articles of note:

"Plucked Lutes in West Africa: an Historical Overview" by Eric Charry — a substantial and detailed article;

"Koto Manufacture: The Instrument, Construction Process and Aesthetic Considerations." by Henry M. Johnson;

"The Physics of a New Clarinet Design" by Arthur H. Benade and Douglas Keefe — a discussion of the late Arthur H. Benade's efforts toward creating an acoustically superior clarinet;

"The Cimbasso and Related Instruments in 19th-century Italy" by Renato Meucci, translated by William Waterhouse — an attempt to determine whether the term "cimbasso," appearing in scores of the time, referred to a specific instrument type;

"Cornett Acoustics: Some Experimental Studies" by Murray Campbell — a discussion of the acoustics of lip-buzzed instruments with side holes instead of valves;

— and several more articles on historical European violins, harpsichords and bassoons, and other topics.

"I Am Not Greg Curnoe, Part 2" by Jack Behrens, in *Musicworks* 64, Spring 1996 (179 Richmond St. West, Toronto, Ontario, Canada, M5V 1V3.)

This second installment on the life and thought of Greg Curnoe (1936-1992) touches a bit more on Greg Curnoe's work with The Nihilist Spasm Band (which played noise music with altered and home-made instruments. The philosophy of Wittgenstein figures prominently in this article as well.

Musicworks 65, Summer 1996 (address above) contains several articles of note:

"Sonic Core: the Cross-Disciplinary Art of Nobuo Kubota," by Paul Dutton, describes the work of this many-faceted artist, including sound installations, percussion assemblages, conceptual sound pieces and the like — lovely, sometimes humorous pieces about observing and listening.

"Unlikely Persona: Jerry Hunt (1943-1993)," by Michael Schell, is an elegiac tribute to sound artist whose take on music, as well as life, was completely his own. His music, often intense and highly agitated, frequently involved electronic and acoustic home-mades in the service of some unexpected conceptual twist or other.

"Fragile Sounds for Transitory Instruments: The Music of the Glass Orchestra," by Michael R. Dobinson, describes the music and performances of this ensemble which plays entirely on instruments made of glass. Several beautiful photographs accompany the article.

Several articles of note appear in *American Lutherie* #45, Spring 1996 (8222 South Park Ave., Tacoma, WA 98408-5226), including —

"Ecuadorian Diary" by Debbie Suran: American luthier Debbie Suran has been working and traveling in Ecuador, and she sends back this report on string instrument making there. She describes instruments from several makers in the region, including guitars, charangos and variants thereof, as well as violins.

"Decorative Techniques in Lutherie" by R.E. Bruné: A

discussion of decorative techniques including painting, inlay, carving, gilding, veneer, engraving and varnishing. Lots of photos of beautiful instruments.

"Paradoxes in Guitar Acoustics" by Alan Caruth: A concise and insightful discussion of the give and take between various acoustic considerations in guitar design.

"More Than a Dozen How-To Videos" reviewed by John Calkin: An overview of available instructional videos on guitar construction.

Woodwind Quarterly Issue 12, Spring 1996 (1513 Old CC Rd., Colville, WA 99114) contains a generous helping of articles on woodwind making, including —

"Wood, Oil and Water" by Raymond and Lee Dessy: This is a regular response column for readers' questions. The authors address various topics in woodwind construction, materials and acoustics.

"David Chu, Flutemaker" (no author credited): Flutemaker David Chu has been working to make modern orchestral flutes, with bamboo bodies and head joints.

"Windways Using a Metal Band" by Dennis Murphy: A description of a simple method for making a windway-and-edge arrangement for pennywhistles, recorders and the like.

"The Clarke Pennywhistle" by Norman Dannatt: A social, commercial and personal history of the original Pennywhistle.

"Diagnosing Woodwind Bores, Part III - Getting to Work" by Jim Gebler: Having dealt primarily with theory in the earlier sections, this third installment in the author's series on acoustic effects of the terrain within the bore for existing wind instruments gets down to the hands-on business of making assessments and correcting for specific problems.

Woodwind Quarterly #12 also contains articles on making fifes, baroque recorders, double reeds and more.

The journal devoted to trump (Jaw harp) known as *Vierundzwanzigsteljahrsschrift der Internationalen Maultrommelvirtuossengenossenschaft* has come out with its Volume 5 (1996) issue, with articles on all aspects of trump culture, history, performance and design. Among them -

"ET: Electronic Trump" by Anton Bruhin: a report on the author's efforts to create an electrically amplified trump. It's not enough to simply amplify the sound of the trump's tongue (that misses the orally resonated overtones), so he developed a system to drive the tongue and sustain its vibration. This has fascinating implications, including the possibility of using other sorts of resonators besides the oral cavity. Further explorations eventually led the author to a completely un-trump-like instrument based on controlled microphone feedback through tuned resonating chambers. The article is in English and German; there are additional technical notes in English by Stefan Flüeler.

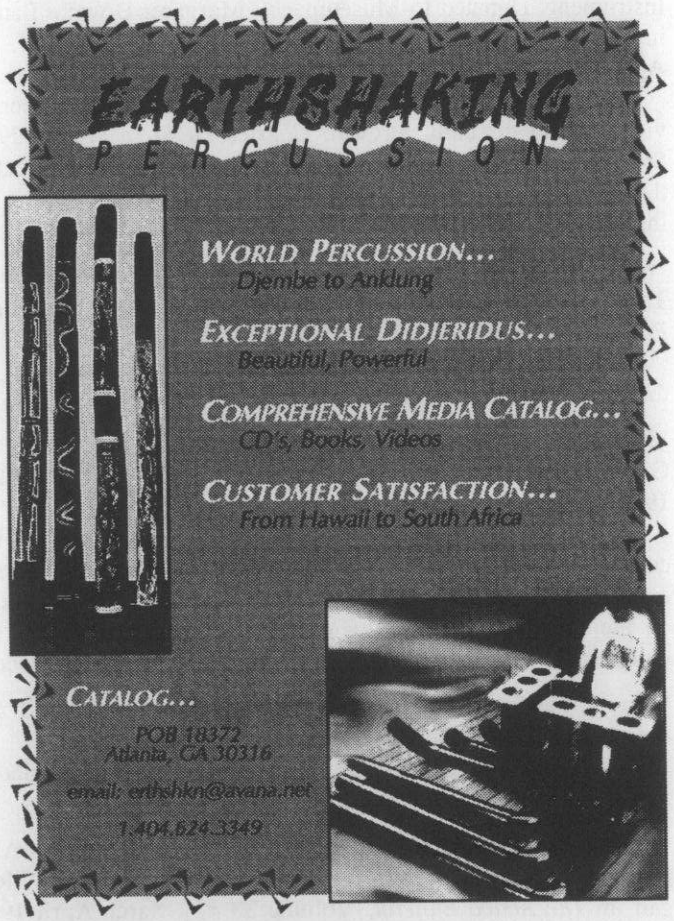
"Trumping on CDs - Some Humdingers" by Frederic Crane: A discography of trump music on CD.

Noisegate #3, May 1996 (c/o 20 Wake Rd., Nether Edge, Sheffield, S7 1HG, England) contains several articles of note:

"Disorientation in Public Places," by Rupert Hartley, is a discussion of ways in which people experience and interpret sound in the urban environment. There are references to designed sound environments and sound-experience experiments from Max Neuhaus, Bruce Audland and others.

"Effingham Pipes: Large Scale Sound Installation, " by Sean Reynard, is a description of a long-tube sound installation designed by the author, with speakers sending sound into the tubes and an electronic switching device to control which signals are sent to which tubes when.

"Atmospheric Electrical Recording: An Introduction and Initial Progress Report, " by Joe Banks, is a discussion of the author's attempts to "harness the creative possibilities of radio as a source rather than a medium," taking advantage of the ambient atmospheric radio wave activity around us.



The following is a list of selected articles relating to musical instruments which have appeared recently in other publications.

"Harry Bertoia Appreciated" by Chris Rice, and "Swift Sounds: Harry Bertoia's Sonambient LPs" by Ian Nagoski, in *Halana* #1 (PO Box 502, Ardmore PO 19003-0502).

Harry Bertoia (1915-1978) developed a set of sound sculptures in the form of forests of upright metal rods. He recorded their sounds in a series of LPs on his Sonambient label. The authors of these two articles visited the barn in Pennsylvania where the sculptures remain today, and spent an afternoon with Harry's son Val Bertoia, who has carried on similar work. A 7" LP containing sounds of the sculptures accompanies the magazine.

"Please Don't Touch the Theremin! Stein Collection of Electronic Instruments Donated to Museum" by Margaret Downie Banks, in *The Shrine to Music Museum Newsletter* Volume XXIII, #3, April 1996 (414 E. Clark, Vermillion, SD 57069).

The primary topic of this article is the musical career of violinist and theremin virtuoso Charles D. Stein (1906-1996). Stein served as head of Lyon & Healy's theremin department in the early 30s. The article also provides some background on the instrument itself.

"Music from Oil Drums: The Acoustics of the Steel Pan" by Thomas D. Rossing, D. Scott Hampton, and Uwe J. Hansen, in *Physics Today*, March 1996.

A little history, a little description, and a lot of acoustics on the Trinidadian steel pan.

"How Did Stradivari Do It With No Gizmos or Computers?" by Glenn Ruffenach, in *The Wall Street Journal*, Friday April 26, 1966.

Inane title notwithstanding, this is an article about work being conducted by a group of researchers at Georgia Tech who are experimenting with feedback systems for guitars. Key locations on the soundboard are electromechanically driven even as the guitar is played, in an attempt to enhance particular resonances.

"Sax Burbles" by George Jameson, in *TechniCom* Vol. 21 #2, March-April 1996 (PO Box 51, Normal, IL 61761).

A discussion of the acoustic effects of the bends in saxophone tubes, and methods of correcting for them.

"Some Observations on Fundamental Differences Between Ampico Model B and Prior Reproducing Systems" by Jeffrey Morgan, in *The Amica Bulletin,* Volume 33 #2, March/April 1996 (919 Lantern Glow Trail, Dayton, OH 45431).

A discussion of reproducing-piano mechanisms, generously illustrated with diagrams and patent drawings.

"Designing the Sonic Environment" by Bill and Mary Buchen, in *Echoes* (Newsletter of the Acoustical Society of America) Volume 6 #2, Spring 1996 (500 Sunnyside Blvd., Woodbury, NY 11797).

The authors discuss various facets of the outdoor sound environment in relation to the principles guiding their own work in creating sound sculpture, installations and environments. They make reference to several of their projects in the field.

"From Scratch: 273 Moons" by Sarah Shieff and Wystan Curnow, in *Music in New Zealand*, Spring 1995 (29 Prospect Terrace, Mount Eden, Auckland 3, New Zealand).

A retrospective of the music of the New Zealand performance group From Scratch, creators of potent, large-scale performance works using instruments of their own design. An interview with group leader Phil Dadson is included.

"Appearances of Glass Music in Literature and Film" by Peter C. Bennett, in *Glass Music World*, Winter 1995 (2503 Logan Dr., Loveland, CO 80538 USA).

Notes on a few references to musical glasses and glass harmonica in film and literature.

"Brass Mouthpieces" by Roy Chiverton, in *FoMRHI Quarterly* #83, April 1996 (Fellowship of Makers and Researchers of Historical Instruments, 171 Iffley Rd., Oxford OX4 1EL, U.K.).

A discussion of brass instrument mouthpieces, with detailed measurements for a variety of early and modern mouthpieces for trombones and trumpets.

Also in *FoMRHI* #83: notes on the acoustics of the bell key in recorders, several discussions of early strings, and more.

"Au-Délà des Cloches" by André Gabriel, in *Percussions* No. 44, Jan/Feb 1996 (18, rue Theodore-Rousseau, F-77930 Chailly-en-Bierre, France).

A study (in French) of bells, touching on "musicology, organology, history, ethnology, linguistics and folklore."

"La Migration des Bàtá Yoruba" by Isabelle Leymarie, in *Percussions* No. 45 (address above).

A look at the reincarnation of the Yoruba talking drums in Cuba and Cuban-derived music. (In French.)

"Klokkenconcert Organiseren in een Stad" and "Music, City and Celebration", both by Llorenç Barber, in *Logos-Blad* 18 #4, April 1996 (Kongostraat 35, 9000 Gent, Belgium).

Llorenç Barber specializes in the music of bells, in its social and civic aspects as well as its musical aspects. Here, in articles in Dutch and English, he discusses his work with city-wide bell concerts.

The British Harry Partch Society Newsletter Volume 1 #4, Feb 1996 (33 Arthur Rd., Erdington, Birmingham, B24 9EX, England) contains articles, letters and editorial comments from a number of sources discussing various facets of the Partch legacy, with an emphasis on the question of authenticity in the performance of Partch's music.

The "Fetish" section of the June issue of *Wired* magazine (520 Third St., 4th floor, San Francisco, CA 94107) features Reed Ghazala's Trigon Incantor, in a big color photo with little text.

Continued on page 42